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# A study of nonverbal communication in a microteaching setting.

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# A STUDY OF NONVERBAL COMMUNICATION IN A MICROTEACHING SETTING

A Dissertation Presented

By

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A Study of Nonverbal Communication in a Microteaching Setting ( March 1973 )

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Problem: The purpose of this study was to evaluate Student Teacher Nonverbal Skill Learning under two pre-service microteaching training procedures.

Background: To the teacher in the classroom, the world of words appears paramount. Students are expected to conceptualize words and word ideas, communicate orally using words in precise meaning. The beginning teacher faced with this expectation of performance, and anxiety on "how do I look", most times assumes a rigid, restrictive posture before the class; presents the materials in a monotone and succeeds in communicating badly.

Microteaching is a teacher training technique in which the time period, number of students, and content are reduced in order to focus on particular aspects of teaching skills. As it has been developed, microteaching is enhanced by the use of video-taping of the student teachers to provide additional feedback with supervisor

and pupil evaluations. This study attempted to bridge the verbal and nonverbal domains in the preparation of teachers utilizing the microteaching setting.

Procedure: Two groups of students were video-taped on four sessions. Session one the students presented a five minute lesson on any topic of their chosing in a lecture mode ( this acted as the pre-test ). Session one concluded with training in each of two microteaching skills. One group was instructed to practice the skill of "nonverbal cues" and the other the skill of "question asking". Session two both groups gave their presentations and received training in a third skill "set induction". Session three after presentations, the students were instructed to combine as many of the skills learned for the concluding lecture. At all sessions students received feedback in the form of viewing the video-tape, supervisor comments, and pupil reactions.

Findings: This study focused on training student teachers in the use of nonverbal skills. Training was defined as both the presentation of information and the opportunity for practice. The control group would be thought of as receiving just the informational component and practice on a different skill "question asking".

It was hypothesized that when beginning teachers 1) received information on nonverbal skills and question

asking skills in the same session and, 2) were encouraged to practice one of the skills, their performance at subsequent microteaching sessions would increase in the practiced skill greater than the unpracticed. It was also hypothesized that the students overall performance on both skills would increase from the start of the microteaching experience to its conclusion. These hypotheses were not supported by the experimental evidence. A third hypothesis, that there were differential predictors of student teacher outcomes based on interaction between various aptitude measures and instructional treatments was supported since indicators of statistically significant individual differences in learning from the several treatment conditions were found. The strongest individual differences occurred in the Question Practice Treatment Group with a positive relationship on all but one of the nonverbal variables.

Implications: The lack of significance on the first two hypotheses might be due to a blocking action of the particular microteaching skills selected. In addition the training of a third skill may not have permitted sufficient feedback and repetition for overlearning to take place and evidence of behavioral changes to be exhibited. Further refinement in precursor variables for prediction and modifications to the microteaching procedures are suggested to strengthen trends observed.

## ACKNOWLEDGMENTS

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Most specially this study is dedicated to my wife, Doris, who through the years has always helped the spirit to lift, no matter how tired the bones, by the gentle power of her smile and love.

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# CHAPTER I

## BACKGROUND AND RATIONALE OF THE STUDY

The purpose of this study was to evaluate Student Teacher Nonverbal Skill Learning under two pre-service microteaching training procedures. This chapter describes the rationale of the study in terms of a) a definition of nonverbal communication, b) importance of nonverbal communication in teaching, and c) definition of microteaching.

### Background of the Study

Probably when Eve was introduced to Adam, his first response was a gesture; one might imagine a smile, and an attempt to find the right thing to say. From that humble beginning humans have developed multi-modal forms of communication, usually emphasizing words, but adding meaning and direction through a wide range of nonverbal elements.

To the teacher in the classroom, the world of words appears paramount. Students are expected to conceptualize words and word ideas, communicate orally using words in precise meaning. The beginning teacher faced with this expectation of performance, and anxiety on "how do I look," most times assumes a rigid, restrictive posture before the class; presents the materials in a monotone and succeeds in communicating badly.

Each individual, culture, and society have their characteristic nonverbal postures, gestures, intonations, inflections and movements. The use of movement seems to make a difference in the way words are perceived and understood. We react to the meaning of the phrase "Good morning" more by the pitch of the voice, the facial expression, body posture and sweep of a hand than by the words alone. We are more acutely aware of miscommunication when the speaker of the words smiles, yet is hunched over, rigid, with fists locked tight. The message of something amiss strikes us immediately. When asked to explain the missmessage the usual response is that the words do not appear to be sincere or friendly. Ogden ( 1961 ) concisely states the orientation of this study,

> "Frowns, smiles, blushes, quivering skin, dwindling pupils, bristling hair, knitted brows -- these gestures only partially under our control make up the repertoire of facial utterance. We call it a language, but that is only courtesy. It voices no concepts, submits no reasons. But it endlessly publishes the shifts of attention, the entreaties and alarms, of the inner life. We often misunderstand it, but we dare not disregard it ..." ( pg. 84 )

Nonverbal Communication

Nonverbal communication has been the subject of writings, and observation for a long period of time, and thus is subject to investigation. The language of

gesture has been viewed as either symbolic or instinctive. Critchley ( 1939 ) has defined symbolic gestures as those that, although having meaning, require interpretation and are utilized as an aspect "of the language of religious symbolism, mythology or folklore." Instinctive gestures as defined by Critchley are comprehended by all, "whatever the age, race, religion, social status, or mental and cultural level."

Darwin, in The Expression of Emotions in Man and Animals ( 1873 ) states that the primary expresive actions of man and lower animals are innate or inherited and not at all governed by learning or imitation. Gestures such as shrugging the shoulders or raising the arms with open hands and fingers extended are conventional signs of impotence and wonder and are also innate, as these and other gestures are inherited. Uplifted eyes and hands in prayer, kissing or nodding of the head are examples of apparently innate gestures which have been learned because according to Darwin they are not universals. Darwin concludes that only a few expressive movements are learned by individuals consciously and voluntarily performing them in the early years of life for some definite object or in imitation. Thus, they become habitual. "The tendency to such movements will be strengthened or increased by their being thus voluntarily and repeatedly performed;

and the effects may be inherited." ( pg. 355 )

As cited in Victoria ( 1970 ), Wolff ( 1948 ) outlines the development of gestural behavior of humans into four distinct phases of development in early life which are influential throughout the life of the human organism: 1) automatic or reflex gestures 2) emotional gestures 3) projective gestures and 4) objective gestures. Automatic or reflex gestures are characterized by a lack of mental representation and are analogous to instinctive behavior; behavior that arouses an immediate need whose satisfaction is final. Emotional gesture is a transitional phase of development between the instinctive and objective phase and its role is to prepare for the development of thought by enlarging consciousness. The type gestures that evolve in this phase include not only the obvious ones such as rage, joy, affection or jealousy that are exhibited by the young child, but also those of imitation. Projective gestures are gestures of intervention: movements of appeal, acclamation or consolation and in turn, gestures of tenderness, affection and curiosity. The objective phase of gesture evolves with the capability of concrete and abstract thought. In Wolff's terms spontaneous or creative thought is governed by the imagination and subconscious, and the descriptive gestures that accompany it are involuntary.

" In all gesticulation which is not consciously or unconsciously utilitarian or persuasive, two tendencies are differentiated: one which expresses thought and the other which expresses self." ( Wolff, 1948:62 )

Historically, persons interested in gesturing have been involved in public speaking. A Manual Of Gesture ( Bacon ), first published in 1872, quotes the writings of such notables as Cicero, Quintillian and Demosthenes on the importance of gesture. The manual includes detailed descriptive and illustrative notation for all body movements utilized in rhetorical speaking. In 1919, Mosher's The Essestials of Effective Gesture was published. The author defines gesture as visible expression "that is any posture or movement of the head, face, body, limbs, or hands, which aids the speaker in conveying his message by appealing to the eye." ( pg. 3-9 )

Research in the realm of nonverbal communication has been in two general areas: Studies of Structure, and External Variable Studies. As Duncan ( 1969 ) reports, the studies which have sought to identify fundamental elements ( or units ) of nonverbal behaviors, and to explore the systematic relationships among these units are classified as Studies of Structure. Most noteworthy of researchers in this area of exploration is

Birdwhistell, who has attempted to codify body motion of American English. At its basic Birdwhistell ( 1952 ) published his microkinesic recording system, analogous to the linguists' phonetic transcription systems. This is a series of "shorthand" notations attempting to indicate the relative position of various portions of the body. In this frame of reference it does not matter who is communicating or the situation in which the act is taking place. But, rather it is the component pieces of the nonverbal segments which when pieced together become the structural "sentence" of communication.

According to Birdwhistell ( 1970 ), communication can be regarded in the broadest sense as a structural system of significant symbols ( from all the sensorily based modalities ) which permit ordered human interaction. The field of communication theory has been exploring nonverbal behaviors as components of linguistics, anthropology, psychology and recently education. Hayes ( 1964 ) and Birdwhistell ( 1970 ) provide a summary of the basic assumptions concerning the communication aspects of body motion:

1. Like other events in nature, no body movement or expression is without meaning in the context in which it appears.

2. Like other aspects of human behavior, body posture, movements and facial expression are patterned and, thus subject to systematic analysis.

3. ... the systematic body motion of members of a community is considered a function of the social system to which a group belongs.

4. Visible body activity like audible acoustic activity systematically influences the behavior of other members of any particular group.

5. Until otherwise demonstrated such behavior will be considered to have an investigable communication function.

6. The meanings derived therefrom are functions both of the behavior and the operations by which it is investigated.

7. The particular biological system and the special life experience of any individual will contribute idiosyncratic elements to his kinesic system, but the individual or symptomatic quality of these elements can only be assessed following the analysis of the larger system of which he is a part.

External Variable Studies

Nonverbal behavior has been the subject of experimental research in psychology since the 1920's. Reviews of the literature: Klein ( 1963 ), Allport ( 1961 ) Bruner and Tagiuri ( 1954 ), Brengelmann ( 1963 ), and Davitz ( 1964 ), indicate most studies deal with nonverbal behavior in a static mode, i.e., models or actors pose certain emotions or reactions to imagined events. A few studies deal with nonverbal behavior under extreme stimuli, or novel situations in which limited conclusions can be drawn about the persons usual nonverbal repertoire. Ekman ( 1965 ) in describing interactive

( or spontaneous ) nonverbal behavior differentiates studies into two types of approaches, indicative and communicative.

> " In indication, the concern is not with what a group of receivers may observe but with the relationship the experimenter is able to establish between a nonverbal act and some other class of events. Thus, the frequency of foot taps might be related to a verbal theme, or the administration of a drug, or the stress in an interview; and foot taps would then be an indicator of this other variable. Indication studies require a method of describing or recording specific classes of nonverbal activity .... Studies of nonverbal indication examine only the sender within the communication system and tell us nothing directly about whether a receiver can decode any systematic information from a nonverbal indicator." ( Ekman,1965:392 )

Communicative studies focus on the receivers and attempt to determine whether a group of judges ( receivers ) agree in their observations or inferences on the meaning of the behavior. Whether the judges interpretation agrees with the intent of the sender is not a major concern. For according to Ekman ( 1965 ),

> " Accuracy or inaccuracy of communication can be examined only if, of course, there is some independent criterion relevant to the sender's experience or his intentional attempt to communicate. Without such a criterion, communicative studies can still investigate whether a nonverbal act or series of acts provides information that is consistently interpreted ( whether rightly or wrongly ) or is ambiguous." ( pg. 392 )

Interaction Recording

The process of interaction recording was first developed by child psychologists like Thomas ( 1929 ). The dimension of behavior which is to be recorded is selected, and skilled observers are chosen usually having familiarity with the culture of the group. Bales ( 1950 ) developed recording categories for group discussions consisting of the following twelve categories: 1) shows solidarity, 2) shows tension release, 3) agrees, 4) gives suggestion 5) gives opinion, 6) gives orientation, 7) asks for suggestion, 8) asks for orientation, 9) asks for opinion, 10) disagrees, 11) shows tension, 12) shows antagonism. According to Argyle ( 1957 ), "Other category sets of interest are the one used by Lippitt ( 1940 ) for aggressive behavior, that devised by Fouriezos and co-workers ( 1950 ) for self-oriented needs in groups, and that of Snyder ( 1945 ) for the study of psychotherapy."

Maccoby, Jecker, et al ( 1964 ), and Jecker, Maccoby, et al ( 1964 ) have studied students' nonverbal behavior during classroom lectures, and found nonverbal indicators of whether a student understands the lecture; and in communicative studies using teachers as receivers they have through training increased teacher accuracy in interpreting the students' behavior.

The relationship of body movement to the social

system of the group is vital to effective communication in a classroom setting. For as Galloway ( 1968 ) notes, the student may be continually verifying the oral statements he receives from the teacher with the actions of the teacher. Where the messages are not clear, the student may take the nonverbal as having the better reality fit. According to Galloway ( 1968:72-73 ),

> " Especially important is the notion that nonverbal messages may be more significant to pupils than teacher verbalizations when they attempt to ascertain the teacher's true feelings and attitudes toward them. A prominent example of this phenomenon occurs with linguistically disadvantaged youngsters who are bombarded by verbal avalanches of teacher talk in classroom settings, and have no recourse but to rely on the nonverbal messages of teacher behavior. It is the culturally disadvantaged child who understands the least amount of information that is transmitted verbally and who reads the most meaning into the nonverbal behavior of the teachers."

## Systematic Studies of Teacher Nonverbal Behavior

Anderson ( 1939, 1945, 1946 ), working with the assumption that the teacher is the most influential component of the classroom environment, classified teachers verbal statements into two categories: Integrative and Dominative. His studies have revealed that integrative teacher behavior tends to evoke integrative pupil behavior and that dominative teacher behavior evokes dominative pupil behavior. Withall ( 1949 ) focuses on teacher's verbal statements as

measures for determining the social-emotional climate in the classroom. Withall did not apply the measures to students as Anderson did, but classified the teachers verbal statements into seven categories ranging from acceptance to disapproval. The teacher is rated as being either "learner centered" or "teacher centered". Flanders ( 1964 ) uses seven categories of teacher verbal statements which are related to those of Withall, two categories for student response, and one category for silence or confusion. By pairing coded observations on the ten categories and assigning them to a matrix, Flanders' system provides a simplified pattern of behaviors characterizing teacher-student interaction.

Galloway ( 1967 ) has constructed seven categories for the systematic observation of teacher nonverbal behavior. On the basis of teachers' facial expressions, actions and vocal language, observers make inference to the appropriate category. Three categories, "enthusiastic support", "helpful", and "receptivity" are considered to be encouraging to communication; three categories, "inattentive", "unresponsive" and "disapproval" are considered to be inhibiting to communication. A neutral "pro-forma" category is used for those nonverbal behaviors that neither encourage nor inhibit communication.

> "The teacher's nonverbal behavior constitutes a model which ranges from encouraging to

> inhibiting communication. Viewing a teacher's nonverbal communication as an encouraging to inhibiting continuum has the advantage of being related to the communication process and of being indicative of subsequent interpersonal relationships between a teacher and pupils. The model is also useful in regarding the potential influence and consequence of a teacher's nonverbal behavior with pupils. The conceptualization of encouraging to inhibiting reflects a process point of view: an action system of nonverbal behaviors that exist in dynamic relationship to the continuing influence of the teacher and pupil in interaction with each other." ( Galloway,1967:5 )

Lail ( 1969 ) reports the use of systematic observation of nonverbal as well as verbal behavior as an evaluative tool in two teacher preparation programs preparing elementary teachers who will be working with disadvantaged children. Lail utilizes Flanders' System of Interaction Analysis and Galloway's Analysis of Nonverbal Communication in combination to provide information of what is said and how it is said. A summary of categories for Interaction Analysis and Nonverbal categories is given on the following page. ( Lail, 1969:177 ).

Victoria ( 1968 ) uses Galloway's Analysis of Nonverbal Communication in combination with Birdwhistell's ( see Birdwhistell 1952, 1970 ) sites of nonverbal action: a) Facial Movement, b) Head Movement, c) Body Movement, d) Arm-Hand-Finger Movement, and e) Characteristic Arm-Hand-Finger Movement. Through

| | VERBAL ( FLANDERS ) | NONVERBAL ( GALLOWAY ) | |
|---|---|---|---|
| | | ENCOURAGING | RESTRICTING |
| INDIRECT INFLUENCE | 1. ACCEPTS FEELINGS | 1. | 1. |
| | 2. PRAISES OR ENCOURAGES | 2. CONGUENT | 11. INCONGRUENT |
| | 3. ACCEPTS OR USES IDEAS OF STUDENT | 3. IMPLEMENT | 13. PERFUNCTORY |
| | 4. ASKS | 4. PERSONAL | 14. IMPERSONAL |
| DIRECT INFLUENCE | 5. LECTURES | 5. RESPONSIVE | 15. UNRESPONSIVE |
| | 6. GIVES DIRECTION | 6. INVOLVE | 16. DISMISS |
| | 7. CRITICISMS JUSTIFIES AUTHORITY | 7. FIRM | 17. HARSH |
| STUDENT TALK | 8. STUDENT TALK RESPONSE | 8. & 9. RECEPTIVE | 18. & 19. IN-ATTENTIVE |
| | 9. STUDENT TALK INITIATION | | |
| | 10. SILENCE OR CONFUSION | 10. COMFORT | 20. DISTRESS |

the analysis of video-tapes of student teachers, Victoria ( 1970 ) expanded the categories to seven with the addition of " eye contact" and "body posture".

> " Analysis ... seemed to support the assumption that specific patterns of body motion do evoke particular qualities, and that the cumulative effect of various body motion patterns do evoke a total qualitative impression in an observer. In descriptive terms, such qualities as acceptance, encouragement, clarification, disapproval, hesitency and insecurity seemed to be reflected by particular gestural behaviors and in the cumulative effect of the total gestural behavior of the student teachers". ( Victoria, 1970:24 )

A review of the literature concerning affective teacher behavior, viewed within the framework of communication theory, has shown that:

> "... the implications of paralinguistics and kinesics for ... teaching ... are enormous. The speaker is free to choose his message- this is strictly imposed by the language ... The speaker is, however, free to color his message in certain ways, and these ways are predominantly paralinguistic and kinesic." ( Hayes, 1964:145 )

The literature has shown that studies conducted in the area of affective teacher communication have been based largely on systematic observation and analysis. According to Simon and Boyer ( 1967 ), observation systems provide a means for describing the role of teacher in reality.

> "Descriptive research using observation systems indicate that the role of the teacher

> appears to be exceedingly consistent across grade levels, subject areas and geographic locations.
>
> The use of observation instruments provides the educational theorist a way to discern the actual teaching patterns in existing classrooms and then to reformulate models of effective teaching either by 1) learning which teacher behaviors correlate most highly with pupil growth or 2) determining which behaviors teachers are using minimally ( or not at all ) which theoretically could contribute to pupil growth." ( Simon and Boyer, 1967:18 )

Microteaching

Microteaching was conceived and first practiced in the context of Stanford University's teacher education program in 1963 ( Allen and Clark, 1967; Allen and Ryan, 1969 ).

> " Microteaching is most succinctly described as a teaching situation which is scaled down in terms of time and numbers of students. In typical practice this has meant a four to twenty-minute lesson taught to three to ten students. Usually a single microteaching episode for any given teacher includes teaching a lesson and getting immediate supervisory and pupil feedback on the effectiveness of the strategy and performance." ( Allen and Clark, 1967:75 )

The Stanford model focused on pre-service teacher education. The pre-service teacher candidates were graduates of liberal arts colleges ( a characteristic of the California certification requirements which places teaching credentials at the fifth year level ), put through an intensive two month training program during the summer in preparation for assuming " student

teaching" positions. Within this framework the program had the students move through three stages:

a) Orientation- to the clinic, its goals, requirements in terms of time, and teaching commitment.

b) Skill identification- which consisted of viewing films of "model" behaviors which were designed to "sensitize" the students to the basic skills and their contextual use.

c) Skill application- which were the microteaching sessions. Here the student attempted to apply the concepts and skills previously sensitized in a teaching setting.

Cooper and Allen ( 1970:4-5 ) in a review of the literature summarize the rationale of microteaching as follows:

> 1. The fact that microteaching is real teaching, albeit constructed in the sense that teacher and students work together in a practice situation ...
>
> 2. Microteaching reduces the complexities of normal classroom teaching, thus allowing the teacher to concentrate on the acquisition of a teaching skill ...
>
> 3. Knowledge and information about performance aids the learner ( in this case the teacher ) in his acquisition of a teaching skill. The immediate feedback from videotape recorders, supervisors, pupils, and colleagues provide a critique of the lesson which will help the teacher constructively modify his behavior...
>
> 4. Microteaching considers the trainee's capacities by allowing him to select the content of the lesson in an area of his greatest competence ...

5. Microteaching provides a setting in which the trainee can teach students of varying backgrounds, intellectual abilities and age groups before facing a class during his student or intern teaching ...

6. Microteaching permits greater control over the trainees' environment with regard to students, methods of feedback, supervision, and many other manipulable variables ...

7. Microteaching provides a low threat situation in which to practice teaching skills, a situation which should be more conductive to learning than the high anxiety level exhibited by many beginning teachers when practicing in actual classrooms ...

8. Microteaching is a low risk situation for both teacher and pupils. Microteaching is not part of the pupils' regular curriculum, therefore their learning is not endangered. Similarly, the teacher need not fear failure for precisely the same reason ...

9. Since active participation by the trainee is preferred, and meaningful materials and tasks are desirable for optimal learning to occur, the microteaching setting allows the student to perfect certain skills that he will subsequently be expected to perform in the regular classroom ...

10. Microteaching allows for the repetitive practice necessary to overlearn skills which will be used during regular teaching ...

11. Microteaching incorporates spaced or distributed practice of a skill over a period of time, allowing for neurophysiological consolidation of the data for long term storage and retrieval ...

## Microteaching in Other Settings

Cooper ( 1967 ) in discussing the Stanford model of microteaching describes it basically as a "Teach, Critique, Reteach, and Critique again cycle." Both

Cooper ( 1967 ) and Ashlock ( 1968 ) emphasize that by having different pupils at each session the student teacher can adapt and modify a presentation to gain the best response to the goals set by the teacher and his supervisor. Guelcher et al ( 1970 ) at the University of Chicago differed in their use of "pupils". Where as at Stanford, public school students were "hired" to act the role of students, the University of Chicago micro-teaching project used "peer" students.

> "There was a general reluctance among these teachers in training to parade their wares before a group ( even a small group ) of pupils. Therefore, in order to increase confidence, diminish the perceived risk-taking, and check the logic of the lesson, the prospective teachers were given an opportunity to test one or several lessons against their peers and under peer supervision." ( Guelcher, 1970:7 )

Huber and Ward ( 1970 ) describing microteaching as used at the University of South Dakota focus on seven teaching skills during an eight week period:

1. Reinforcement
2. Pre-cueing, Teacher Silence and Nonverbal Cues
3. Questioning and Completeness of Communication
4. Establishing Set and Achieving Closure
5. Providing, Eliciting and Recognizing Feedback
6. Redundancy and Repetition
7. Establishing Appropriate Frames of Reference and Varying the Stimulus

Peer "students" were used during the initial microteaching experience, and actual pupils during the last week to form a "bridge" to reality.

Perlberg and O'Bryant ( 1968 ) and Perlberg, et al

( 1968 ) have used microteaching techniques and portable video recorders in improving instruction at the college and university level. Work was done with individual faculty members, or groups of faculty members, utilizing the basic microteaching procedures outlined by Allen and Ryan ( 1969 ). According to Perlberg ( 1970:41 ), "It should be noted that the participants were often encouraged to proceed because they experienced for themselves the authenticity of the feedback, the practicality of the microteaching procedures and its effectiveness in modifying behavious."

Ivey ( 1968 ) has applied microteaching procedures to counsellor training. He tested the effectiveness of this microcounselling in training for three skills of great importance in any counselling situation; "attending behaviour, Rogerian reflection of feeling, and summarisation of feeling". He found the method sufficiently effective to suggest that many more counselling skills could be developed, and suggests, "... that behavioral skills such as those presented in microcounselling and media therapy be viewed as only part of the route toward personal growth." ( Ivey, 1972:12 )

Evans and Cooper ( Allen and Ryan, 1969 ) have adopted microteaching procedures in two workshops designed to train Peace Corps personnel. In both, these

procedures seemed to facilitate better training results and the attitudes of trainees were favourable.

Jason ( 1967 ) has used basic microteaching procedures in medical education. Third-year medical students interviewed patients in a simulated doctor's reception room. The "patients" were trained to perform various roles. Interviews were taped and brought to class for analysis and, after incorporating suggestions were then tried again by the same student. Model tapes of doctor-patient relationships were developed.

Use of Television Recordings in Teacher Education

One of the problems in a study of nonverbal communication is reproducability for training purposes. An observer in a classroom attempting to record the dynamic interaction on several modal planes is bound by his perceptions, note taking ability, biases ( cultural or linguistic ). The development of video-tape equipment with "stop-action" features has expanded the potential for studies and training.

Acheson ( 1964 ) and Olivero ( 1964 ) studied the effectiveness of using television recordings as a supplement to and/ or replacement for live observation. In both studies supervisory conferences using television recordings of the teachers' performances resulted in significantly greater change in teacher

behavior than verbal feedback alone. McDonald et al ( 1966 ) and Orme ( 1966 ) have shown similar results. Schueler et al ( 1962 ) reported no significant differences with the use of television. However, the authors cite several reasons for the findings, among them the range of variation in the teaching situations.

In terms of supervisory techniques using television recordings, Acheson ( 1964 ) revealed no significant differences between directive versus heuristic non-directive styles of supervision during a critique using television recordings as a feedback medium.

In summary, the review of the related literature indicates a general acceptance, on the part of teacher educators, of microteaching in conjunction with video recording as an effective way to provide teachers-in-training with opportunities to practice and develop pedagogical skills.

While researchers have concentrated on nonverbal communication as a "linguistic" entity, and other researchers have treated the training of verbal skills in a microteaching setting, little has been done to have teachers or teachers in training made aware of the nonverbal mode of communication. This study attempts to bridge the verbal and nonverbal domains in the preparation of teachers utilizing a microteaching setting.

# CHAPTER II

## THE RESEARCH PROBLEM AND DESIGN

Student Teacher Nonverbal Skill Learning was investigated in this study through an experiment using pre-service teacher trainees under two microteaching training procedures. This chapter describes the experiment in terms of procedures used in a) data collection, b) selection of variables for rating, c) collection of ratings, and d) statistical analysis.

Three basic questions were considered in this study:

1. Can a beginning teacher be prepared to exhibit greater diversity in the use of instructional communication modes? In particular, can these student teachers develop an ability to utilize the nonverbal mode of communication -- by itself or in concert with the verbal mode?
2. Will beginning teachers introduced to two teaching skills in a single session and encouraged to practice one of the skills, be rated as having more of the practiced skill incorporated into their subsequent micro-teaching sessions? In other words, are the skills of "nonverbal communication" and "question asking" practice dependent in a pre-service protocol?

3. Are there differential relationships between scores a beginning teacher receives on an aptitude test ( i.e., Pretest ) and their performance of skill use? Specifically, are there "types" of students for whom one training procedure is more effective than another?

Overview of Design

Figure 2-1 indicates the experimental design. The students were randomly assigned to the treatment groups.

Definition of Terms

The following terms are defined operationally as they are used in the study:

Feedback -- any response or reaction of students, whether observed through tests, evaluative devices or by other means which will inform the teacher of the effectiveness of the techniques and styles used and permit modifications to the procedures.

Interpersonal Characteristics -- behaviors which are observable, illustrated but not limited to:

1. overall manner and general appearance
2. amount of activity or frequency of interaction
3. written communication
4. oral communication
5. nonverbal gestures, stances, movements

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Group I | Lecture Video Tape | Nonverbal and Question Training | Nonverbal Practice Video Tape | Set Input | Set Practice Video Tape | Final Input | Lecture Video Tape |
| Group II | Lecture Video Tape | Nonverbal and Question Training | Question Practice Video Tape | Set Input | Set Practice Video Tape | Final Input | Lecture Video Tape |
| | Rating Number 1 | | Rating Number 2 | | Rating Number 3 | | Rating Number 4 |
| | Session 1 | | Session 2 | | Session 3 | | Session 4 |

Figure 2-1

Model of Experimental Design

Microteaching -- a teaching situation in which class size, scope of content, and time are reduced. The teacher in this training protocol receives immediate feedback in the form of either written evaluation from the subjects; or oral suggestions from a trained observer; or the opportunity to observe the precedings on video-tape. With intensive feedback as well as additional informational input permitted, modification of style or orientation is possible.

Assumptions in the Study

1. That nonverbal gestural behavior is a measurable aspect of student teacher communication behavior within the context of the teaching learning situation.

2. That nonverbal gestural behavior as evidenced by student teachers evokes, among others, the following qualities:

a. Enthusiastic

b. Receptive-Helpful

c. Clarifying-Directive

d. Neutral

e. Avoidance-Insecurity

f. Inattentive

g. Disapproval

## Design Components

### The Sample

Subjects were drawn from the course, "Kids, Schools, and the School of Education" at the University of Massachusetts. This course is the introductory course for students interested in teaching as a profession. Therefore, these undergraduates represent the general university community and were seeking initial information on the field of education. The course offered the students four options to gain initial information on teaching on a personal level:

a) observation of pre-school ( nursery ) classes

b) observation of elementary "open classrooms"

c) one-to-one tutorial community work on the secondary level

d) microteaching- cross grade and subject levels

Students who were undecided as to grade level or subject area, as well as those who were unsure of whether teaching should be their career were encouraged to select the microteaching component. Students who had indicated a strong preference in grade level or subject area and wanted information on their capabilities were similarly encouraged to select the microteaching option.

These selection criteria suggest that generalization from this sample to other populations of beginning

teachers would be inappropriate. However, the independent variables of this study were not used as the basis for selection, and it is not unreasonable to suppose that these student teachers are representative of the general pool of beginning teachers with regard to diversity in using different instructional modes. That is, the students are the products of the traditional system of teaching, and might be expected to have perceptions of modes of instruction quite similar to those of their teachers and the other students of these teachers.

## Training Procedures

Training, in this study, refers to the provision of opportunities for beginning teachers to enable them to expand their repertoire of instructional modes. This use of the term training may differ somewhat from traditional notions in that the instructional approach is more indirect than direct. Thus, training and preparation will be used interchangeably, but with this indirect notion in mind.

The training was basically concerned with directing the students attention to variable use of different instructional modes. These modes would be used in presentations designed to explain a given concept or problem.

The training began as the students signed up for

the microteaching option. Each participant received a copy of "Microteaching-What is it" ( see Appendix A ), and the following instructions:

> "The microteaching component requires a time commitment of four one hour sessions. Read over the information contained in the handout 'Microteaching-What is it' and come to the first session prepared to 'lecture' for five minutes on any topic at any grade level you wish."

The use of "lecture" for the initial teaching experience was based on the notion that most undergraduates have been exposed to extensive lecturing "models" in their years as students. Additionally, the "lecture" being usually seen as one-way communication permits the beginning teacher the opportunity to become accustomed to the microteaching environment and talking to a group of "peer" pupils.

Prior to the arrival of the students at the microteaching clinic facility, each subject was assigned to a treatment group by the use of a table of random numbers.

The University of Massachusetts Microteaching Clinic is a recently completed facility located in the School of Education, designed for extensive use of audio-visual materials ( focused on video-taping ) in teaching

situations. See Appendix B for a diagram of the facility. As this study was the first such project to use the new facility, procedures were developed and modified in response to the "bugs" found.

Upon arrival to the clinic the students were randomly assigned ( based on order of arrival ) to microteaching rooms and "teacher-helpers" ( see section on collection of ratings, for a discussion of the "teacher-helpers" ). As the students were permitted to select which four sessions of the twenty-four possible sessions, each hour could contain students at any phase of the study.

For the initial session, the teacher-helpers attempted to put the students at ease by explaining again the purposes of the microteaching experience ( as outlined in the handout, "Microteaching-What is it" ), the pieces of equipment in the room ( video-tape unit, TV camera, microphone ) and that their performance would not be graded or in any way affect their being accepted into a certification program, or placement as an intern. In short, stressing the "failure free" aspect of the microteaching experience. Each student received a name tag, so that his or her "pupils" could be called upon by name if desired. The teacher-helper then randomly assigned presentation order. The students presented

their five minute "lectures" to their class of four or five peer pupils, in order until all had completed.

While the video-tape was being rewound, the teacher-helper distributed two handouts entitled, "Nonverbal Cues" ( see Appendix C ), and "Using Questioning in Teaching" ( see Appendix D ). Each student then received individualized feedback from the teacher-helper including:

a) viewing their presentation uninterrupted for the entire presentation,

b) receiving encouragement on the positive aspects of the presentation as evidenced by the pupils reactions and the students "feelings",

c) replay of the last minute of the tape with the sound portion turned off, with the instruction to the student to view the "visual impact" of the person on the screen,

d) summary of the lessons high points and instruction to prepare for the next session "the same or a different lesson utilizing the skill of ..." either nonverbal communication or question asking. The teacher-helpers had rosters containing the names of the students, dates of sessions, and treatment per session.

At the second session, the student after giving the presentation received:

a) individualized feedback from the teacher-helper including the viewing of their presentation,

b) dialogue with the teacher-helper on goals of the lesson, and the attainment of the objectives,

c) dialogue with the "pupils" to obtain feedback on their perceptions of the lesson,

d) summary by the teacher-helper of the high points of the lesson and instructions for the next session to "prepare the same or different lesson using the microteaching skill of Set" ( see Appendix E, "The Nature and Procedures of the Set Induction Process" ).

For the third session, the students indicated the order of presentation by volunteering. After the group had presented their lessons, each student received individualized feedback by;

a) viewing the presentation on video-tape, with supplemental comments by the teacher-helper. The student was encouraged to ask to have the tape stopped, rewound, moved forward based on the needs of the student and the goals he or she had in mind,

b) dialogue with the teacher-helper and pupils on their perceptions of the lesson, based on the goals verbalized by the student,

c) group interaction on the nature of the teaching process,

d) instructions that at this point the student had been introduced to four microteaching skills ( lecture, nonverbal cues, question asking, set induction ), and for the final session "to prepare the same or different lesson using the lecture mode trying to incorporate as many of the skills exposed to so far".

The final presentation order was determined by the students, lessons presented, and feedback presented by:

a) viewing the video-tape with the entire "class" partaking in the dialogue and feedback,

b) the teacher-helper acting as small group discussion leader focusing the student and the group towards the skills of teaching and whether the particular student schieved the goals they had set forth,

c) summary by the teacher-helper of the micro-teaching process as they had experienced it, and thanking the participants for their cooperation and attendance.

Students were requested to write an evaluation of the microteaching experience consisting of two basic questions, a) What was your expectation of microteaching prior to your experience, and b) describe your reaction to the microteaching experience having completed it. In addition, a portion of the course evaluation focused on the microteaching component for those students who

selected that option.

No formal follow-up training was provided. However, those students who took the initiative to obtain further information from the experimenter were provided with answers to specific questions. About one-quarter of the group requested such information.

## Variables Studied

### Nonverbal Communication

One basic variable investigated in this study was that of the trainability of nonverbal communication in a microteaching setting. Each student received a score in each of the categories of the Instrument for the Systematic Observation of Nonverbal Behaviors adapted from a similar instrument by Victoria ( 1970 ).

Nonverbal communication can be defined, for this study, as any use of eye contact, facial motion, head motion, body posture, body motion, arm-hand-finger motion, or directed arm-hand-finger motion that is attempted to facilitate the teaching learning situation. By facilitate, it means being viewed on a continuum from restrictive to encouraging based on a scale developed by Galloway ( 1968).

Nonverbal communication was measured for each student at the first microteaching session, immediately after the training ( second session ), at the third and at the fourth or final session. The initial

measurement was to act as a base line of information on the students use of nonverbal communication. The measure after the training was to indicate if training had made a difference, and the final measure attempted to view the effects after a "delay" period.

Instrument for the Systematic Observation of Nonverbal Behaviors

The Instrument for the Systematic Observation of Nonverbal Behaviors ( see Appendix F ), devised by Victoria ( 1970 ), has been used primarily with student teachers of art, but appears to be applicable to beginning teachers in general. The instrument scans systematically the sites of nonverbal communication as used by Birdwhistell ( 1952 ) on one axis and rates the use of each site on a continuum from restrictive to encouraging as developed by Galloway ( 1968 ) on the other axis.

A pilot study by Victoria ( 1968 ) resulted in the development of the categories of the Instrument for the Systematic Observation of Nonverbal Behaviors. A second study ( Victoria, 1970 ) attempted to test the reliability of the Instrument by the rating of 30 minute video-tapes of student teachers of art. Judge agreement in categorization of gestural behaviors ranged from 62 per cent to 78 per cent with a mean agreement of

68 per cent, with similar results for categorization of reflected qualities ( Galloway's scale ) also with a mean of 68 per cent. Victoria utilized a factor analysis with Chi-square.

Practice vs. Nonpractice

The second variable under consideration was the effect of practice in the change of behavior of the student teachers. The review of the literature indicates that practice increases skill learning. Thus, by presenting information to both groups on nonverbal communication and question asking and suggesting that only one group practice one skill, the opportunity to observe the incorporation of the behaviors was present. The Instrument for the Systematic Observation of Nonverbal Behaviors was used to compare the use of nonverbal gestures pre and post training. As a second check, a frequency count of questions asked was made using the audio portion of the video-tapes.

## Observations

### Procedures for Conducting Observations

Guidelines for conducting observations, including the selection and training of observers, were taken from Medley and Mitzel ( reported in Gage, 1963 ). Three basic areas of concern should be noted:

Representative Sample Behaviors: In order to obtain representative samples, it was deemed necessary to obtain at least 4 minutes of performance in the presentation mode. As related in the preceding discussion, an observation period of five to six minutes was scheduled for each of the microteaching lesson segments.

The coding of observations involved lengths of about five minutes in all but a few of the cases. A category plus time rating was employed, meaning that ratings were performed at 3 second intervals.

Accurate Record of Observed Behaviors: Video-tapes were used to record teacher performance. The experimenter worked closely with the video-tape operators to ensure accuracy of recording.

Rough reliability measures were used in the initial period of use of the observation instrument. Changes were made in procedures of coding in this period in order to ensure accuracy of recording.

Faithful Scoring of Records for Behavior Differences: The procedures for processing observer codings was established while the observer coding was being accomplished. The reliability figures reported in this study are based on the ratio and proportion measures derived from observer codings. In addition to the ratio and proportion measure reliability figures, the

observers' coding was continually checked for rough reliability levels, and considered acceptable at levels between 80 per cent and 90 per cent agreement.

Observers' Selection and Training

The task of the observers for this study was to independently view video-tape recordings of student teaching performances and code the behaviors of the students using the Instrument for the Systematic Observation of Nonverbal Behaviors.

Observers were chosen on the basis of familiarity with observation and supervision techniques, not necessarily in the field of education. Two of the observers were graduate students in the School of Education of the University of Massachusetts. One observer was a staff member of the University Health Services. The experimenter acted as the fourth observer.

The two graduate students also acted in the role of teacher-helper. The role of teacher-helper is particularly critical to a study involving microteaching. A review of the literature ( Acheson, 1964; Olivero, 1964; and Hoerner, et al, 1971 ) indicates that if the participants "feel" comfortable with the persons giving the feedback, the experience is more meaningful. The teacher-helpers had worked with the experimenter in a

previous course "Supervision in Microteaching" and had demonstrated a knowledge of the skills of individualized and small group conference techniques. As well as the necessary technical competence to operate the video-tape equipment unobtrussively. Prior to the beginning of the study the teacher-helpers went through a training period including:

a) an orientation to the general purposes of the study.

b) the specific procedures to be followed with the students, as well as the content of materials to be given to the participants.

At the conclusion of each session a debriefing was held to deal with any particular problems from equipment malfunctions to rescheduling students to changes in feedback techniques.

All the observers underwent a training period which included:

a) reading of Galloway's Nonverbal Behavior in the Classroom ( 1967 ),

b) two four hour intensive training periods on the categories of observation ( see Appendix G ), and guidelines for observation ( see Appendix H ). Video-tapes of student teachers on site from 1971-72 were used as model tapes for practice rating and clarification of

categories. Initial viewing of the tapes was done without time limit to establish agreement on meanings of ratings. Progressive restrictions were placed on the rating until observers reached a rough reliability of 80 per cent to 90 per cent within three seconds in each category,

c) practice sessions prior to actual rating at each observation session. This permitted the observers to regain their accuracy at the three second interval and maintain the rough reliability.

In the observer training period, and during the actual observation sessions, two problems arose. First, the observers found working with the printed Instrument for the Systematic Observation of Nonverbal Behaviors difficult. With the television monitor at eye level and the pages at lap level, it was felt that too much time was spent looking down for the categories and marking the page and too little time watching for the behaviors. Thus, added to the recorded three second tone was the title of the category under observation. The observers then systematically wrote the rating across the page without having to look down for long periods of time, in order to find the category column and mark the appropriate number.

Secondly, two of the observers had different views of what constituted encouraging and restrictive nonverbal behaviors. Nonmovement was viewed as neutral behavior

whereas the other observers viewed nonmovement as restrictive. The definitions and training were designed to overcome this difference, and the initial data suggested that it had been resolved.

## Other Sources of Data

### Anecdotal Data

In addition to the data collected to test the main hypotheses, anecdotal and semi-formal data ( formal reports not primarily designed for this study ) which could be used as evaluative feedback on the effectiveness of the procedures as perceived by the students.

Course Evaluation Form: the students were asked to evaluate the various components of the course, including the microteaching component. In addition these students were asked to prepare a short report answering the following two questions:

a) What was your expectation of microteaching prior to your experience?

b) Describe your reaction to the microteaching experience having completed it.

Informal Discussions: during the course of the study, informal discussions were held with the teacher-helpers, and the students. The experimenter attempted to discern any problem areas specifically affecting the

students, and how he/she was progressing with the microteaching.

Personal Observations: the experimenter had occasions to visit the microteaching sessions throughout the study. Therefore, personal observations of teacher-helper-student interactions, technical aspects of the video-taping, and feedback modes were noted for post session discussions and design modifications.

## Plan for Analysis

The basic questions, the design, and the design components have been presented; the plan for analyzing the data may now be stated. In this section, the formal hypotheses and statistics used in the analysis are presented.

### Hypotheses

Hypothesis 1: Training Increases Student Teacher's Performance. There will be an increase in Student Teacher's use of Question Asking and Nonverbal Behaviors after microteaching training.

Hypothesis 2: Practice Increases Student Teacher's Performance. Student Teachers introduced to "nonverbal" and

"question asking" skills in a single session and encouraged to practice one will be rated incorporating more of the practiced skill than the non-practiced in subsequent video-taped microteaching sessions; the criterion measure for the nonverbal skill is the rated category scores on the Instrument for the Systematic Observation of Nonverbal Behaviors adapted from a similar instrument by Victoria ( 1970 ), and for the question asking skill the number of questions asked.

## Statistical Procedures for Testing the Hypotheses

The experimental design for testing Hypotheses 1 and 2 involve taking observations on the eight variables: "Eye Contact", "Facial Motion", "Head Motion", "Body Posture", "Body Motion", "Arm-Hand-Finger Motion", "Directed Arm-Hand-Finger Motion", and "Number of Questions Asked", and repeating these observations on four occasions. In order to determine whether or not the performance of the students improved it is necessary to compare the means of the students on these variables over the four occasions.

There are several procedures that are available for testing the equality of means. The simplest approach would be to employ the univariate repeated measurements design for testing the equality of means for these variables individually. This procedure has several drawbacks, it has to be assumed that the variances of the group over the four occasions are equal and that all pairwise correlations between the occasions are equal. In other words, it has to be assumed that the correlation of the students performance between occasion 1 and 2 is the same as the correlation of the performances between occasions 1 and 3, 1 and 4, 2 and 3, and so on. Even though this assumption of equal variance constant correlation appears to be more tenable than the assumption of complete independence ( or, no correlation ) of occasions, it may be too restrictive under certain circumstances.

In general, in studies of growth and change where measurements are repeated on an individual, it must be assumed that the measurements have a correlated sampling variation. Hence, any rigorous procedures for statistical inference from a repeated measurements design must be developed from a general multivariate sampling model. This does not, of course, preclude univariate analysis of the data where applicable. Univariate tests,

and when the sampling covariance matrix has certain favorable patterns, univariate procedures can be adopted. The multivariate procedures, in any case, contain these univariate procedures as special cases, and thus, when appropriate, a univariate solution is immediately obtained.

The first question of interest in testing these hypotheses is simply, "Are the mean scores of the group on each ocassion significantly different?" This would determine whether or not the group changed. Suppose that the null hypothesis of equal means is rejected, i.e., we conclude that the group has changed. It will be important then to determine exactly between which occasion the means changed. This would shed some light on the effectiveness of the training, and the researcher can then proceed to establish causal connections between the change and the training.

The next stage in evaluation could be that of comparing the treatment group with a control group. We shall now formulate the questions that arise in connection with these hypotheses. These can be stated as:

Q1. (a) Did a group change over time as a result of the training?

(b) Is it possible to identify between which occasions significant change occurred?

Q2. How do the different groups compare with one another?

In order to answer these questions, and in particular Q2, it is convenient to plot the group mean score of each group as a function of occasion. That is, we plot a graph of group mean scores against occasion. Such a graph will be called a group profile and is illustrated below for the case of two groups and four occasions.

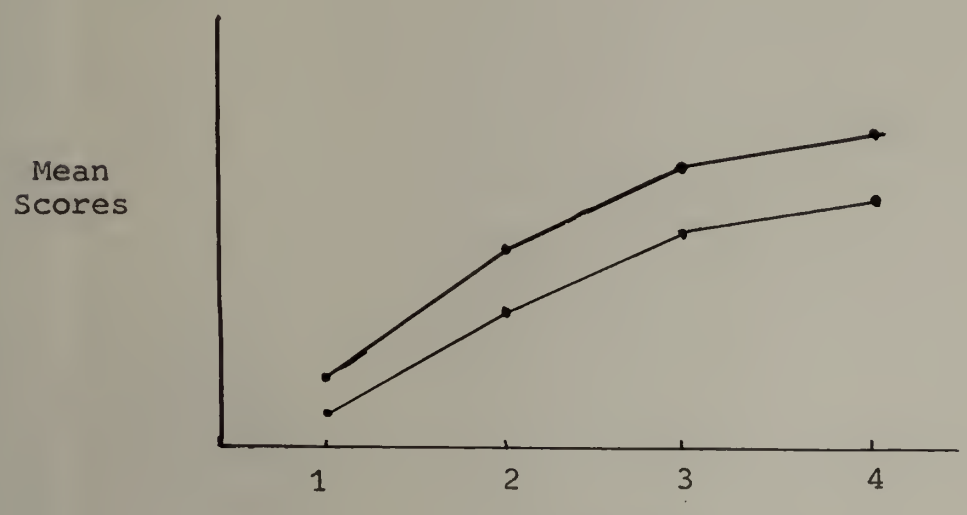



Figure 2-2

In terms of the group profile, we restate question 2, Q2, as,

Q2. (a) Are the population mean profiles similar, in the sense that the line segments of adjacent occasions are

parallel?

(b) If the two population profiles are indeed parallel, are they also at the same level?

(c) Assuming that the profiles are parallel, are the population mean scores for each group at each occasion different?

The first question, Q2(a), addresses itself to the hypothesis of no group x training interaction. If the hypothesis of parallel profiles is not rejected, it could be concluded that the groups ( in this case, two groups ) performed identically over time.

If the hypothesis of parallel profiles is not rejected, then the researcher may ask the second question, Q2(b). As mentioned above, if the profiles are at the same level, the researcher could conclude that the two groups are at the same level of achievement.

The last question, Q2(c), is in fact identical to question Q1(a). Since several groups are involved, it may be more convenient, computationally at least, to determine whether or not <u>all</u> the groups under consideration changed <u>simultaneously</u>. Such a simultaneous test for all the groups is possible only if the hypothesis of parallel profiles is tenable. If not each group has to be

tested separately. The advantage of a simultaneous test is that, if there are g groups, the probability of rejecting at least one null hypothesis ( the null hypothesis here is simply the hypothesis that the group did not change ) can be set at any desired level, a. If the g null hypotheses are tested separately, then the probability of falsely rejecting at least one null hypothesis ( the probability of committing at least one type I error ) gets inflated.

Since there are two treatment groups, the Hotelling $T^2$ statistic is appropriate for testing these hypotheses. Unfortunately no procedures are currently available for testing the hypotheses regarding profiles when there are several variables. Hence, a test for the profile for each variable will be conducted separately. The only drawback with this procedure is that the significant results have to be interpreted with care. As mentioned earlier, when tests are carried out separately the probability of falsely rejecting the hypothesis is considerably increased.

Similar problems arise when the raters are to be compared. The procedure for comparing more than two groups simultaneously is extremely complicated and at best, the tests of significance are approximate. Hence, it was decided to combine the raters into two groups,

male and female, in order to compare the profile on each occasion in turn.

Hypothesis 3: There will be differential prediction of Student Teacher Behavior outcomes based upon interaction between various aptitude measures and instructional treatments.

Hypothesis 3 may be viewed as attempting to answer the following questions:

a) How are the families of variables related to each other?

b) What are the multivariate relationships between the predictor variables and the criterion outcomes?

c) What are the interactions between aptitudes, treatments and outcomes under the unique ecological circumstances involved?

In this setting aptitude is defined as any quantifiable relavant data available about the students prior to the outcome measurement. Thus the student behavior from the first session which has been designated as a pretest in the previous analysis together with the characteristic of sex were here identified as aptitude predictors.

The search for interactions involving individual

differences is complex. A procedure for gaining understanding of the importance of interaction potentials starts with simple relationship analysis. For example, the concept of finding families of variables that are related to the criterion measures but that are relatively unrelated to each other can strengthen success prediction. Then, for examining directly the amount of variance accounted for by different variable clusters for the different criterion measures, the use of stepwise regression analysis is suggested. Finally, early performance is examined for prediction of individual differences in success under the several treatment conditions.

Within the complexities the complexities of individual differences on the several aptitudes relative to the several treatments, initial relationships within predictor variables may portend relationships in terms of differential treatment effects that are worthy of further study under these conditions. That is, a particular location along a predictor-treatment regression line may be related to different outcomes according to the treatment those students are processed through. If such relationships are found, then each treatment may be considered best for some kinds of students and not for others no matter what the average relationships the

several treatment groups accomplish relative to the criterion measures.

Therefore, from the above discussion the following procedures were suggested to examine possible relationships:

a) A zero order correlation matrix ( Pearson r ),

b) Stepwise multiple regression procedures, and

c) Tests of parallelism of regression.

# C H A P T E R III

## DATA ANALYSIS

In this chapter, results of the testing of the hypotheses are reported, and discussed. Other data, both formal and anecdotal, are also presented and discussed.

### Results of Hypotheses

In the following section, the hypotheses are restated and the statistics pertinent to each hypothesis are reported.

Hypothesis 1: Training Increases Student Teachers Performance. There will be an increase in the use of Nonverbal Skills and Questioning after training in a micro-teaching setting.

Hypothesis 2: Practice Increases Student Teachers Performance. Student Teachers introduced to "nonverbal" and "questioning" skills in a single session and encouraged to practice one will be rated incorporating more of the practiced skill than the non-practiced in subsequent video-taped microteaching sessions; the criterion measure for the nonverbal skill is the

rated category scores on the Instrument for the Systematic Observation of Nonverbal Behaviors adapted from a similar instrument by Victoria ( 1970 ), and for the question asking skill the number of questions asked.

The Hotelling $T^2$ Profile Analysis was used to examine the first two hypotheses. Referring to Appendix I ( Profile Analysis, Student Data ) with the exception of the variable "Body Posture", the assumptions of parallel groups and scores at the same level could not be rejected. Examining the profiles, trends seem to indicate that the variables "Eye Contact", "Head Motion", and "Body Posture" show that treatment may affect performance. For these variables the final rating at session four were close to being significant at the .05 level as being different from the starting point.

Variable "Body Posture" for which the hypothesis of parallelism could be rejected, was subjected to an analysis of equal response effects. This produced an $F= 23.33$ with 3 and 19 degrees of freedom, significant at the .005 level that there were not equal treatment responses across the four sessions. Confidence intervals were set up to examine size changes between:

a) session one and session two

b) session two and session three

c) session three and session four

d) session four and session one

There was a significant size change from session two to session three at the .05 level, for students who were told to practice nonverbal skills ( Group I ).

The profile of Question Asking while seeming to show greater change in Group II ( Question Practicing ) statistically neither parallelism or size differences could be rejected. Further examination of the profile seems to indicate that the visual impression may be one of scale effect, whereby the number of questions asked by either treatment group was so small that the plotting of the results are exagerated.

Hypothesis 3: There will be differential prediction of Student Teacher Behavior outcomes based upon interaction between various aptitude measures and instructional treatments.

The following procedures were used to examine this hypothesis:

a) zero order correlation matrix ( Pearson r )

b) stepwise multiple regression

c) test of parallelism of regression

These procedures have as their assumption that a linear relationship exists between the variables.

Referring to Tables 3-1, 3-2, and 3-3, there appears a strong intrasession correlation for the Nonverbal Practice Group, with increasing question asking relationship with each session. While there was a general nonverbal pattern initially, at each succeeding session the students seem to become more specific to some types of nonverbal behaviors than others which resulted in reduced relationships in subsequent sessions. Inter-session correlation relationships reflect this general tendency.

For the Question Asking Practice Group, the same tendency as above exists, but the initial intrasession relationships were fewer.

Tables 3-4 and 3-5 indicate those variables which show significant contribution to prediction of criteria success on the appropriate instrument for each treatment group. It might be noted that, in general, multiple variate explanation of variance is enhanced by having variables that are related to the criterion but which are relatively independent to each other, creating a possibility of nonoverlapping additive explanation of variance. The multiple regression relationships provide a look at the components of variance accounted for in terms of final performance under the several treatments. A basic problem arises in this study because of the

TABLE 3-1

VARIABLE IDENTIFICATION

| Code | Name |
|---|---|
| NV1 | Eye Contact |
| NV2 | Facial Motion |
| NV3 | Head Motion |
| NV4 | Body Posture |
| NV5 | Body Motion |
| NV6 | Arm-Hand-Finger Motion |
| NV7 | Directed Arm-Hand-Finger Motion |
| NVT | Total Score of Nonverbal Variables ( NV1 + NV2 + ... ) |
| QA1 | Questions Asked Session One ( Used to denote separation of variables by session ) |
| QA2 | Questions Asked Session Two |
| QA3 | Questions Asked Session Three |
| QA4 | Questions Asked Session Four |

| | SEX | NV1 | NV2 | NV3 | NV4 | NV5 | NV6 | NV7 | NVT | QA1 | NV1 | NV2 | NV3 | NV4 | NV5 | NV6 | NV7 | NVT | QA2 | NV1 | NV2 | NV3 | NV4 | NV5 | NV6 | NV7 | NVT | QA3 | NVT | QA4 | MEAN | STD DEV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SEX | | 30 | 26 | 28 | 45 | 44 | 49 | 57 | 44 | 29 | 04-19 | 02 | 14 | 32 | 35 | 65 | 32 | 27 | 38 | 42 | 49 | 03 | 16 | 27 | 36 | 48 | 23 | 39 | 08 | | | 1.7 | 0.46 |
| NV1 | | | 83 | 80 | 64 | 60 | 65 | 50 | 66 | 32 | 44 | 53 | 50 | 70 | 61 | 19 | 42 | 66 | 07 | 75 | 79 | 74 | 17 | 01-03 | 10 | 59 | 27 | 27 | 12 | | | 281.6 | 42.23 |
| NV2 | | | | 88 | 77 | 72 | 66 | 55 | 68 | 45 | 66 | 74 | 67 | 76 | 64 | 02 | 18 | 69 | 32 | 67 | 66 | 57 | 02 | 14-02-02 | 49 | 18 | 11 | 12 | | | 280.6 | 33.31 |
| NV3 | | | | | 79 | 74 | 54 | 55 | 61 | 40 | 74 | 66 | 66 | 89 | 75 | 15 | 32 | 80 | 23 | 70 | 65 | 56 | 28 | 28-13-04 | 52 | 19 | 02 | 06 | | | 267.5 | 22.87 |
| NV4 | | | | | | 94 | 79 | 87 | 72 | 35 | 59 | 54 | 53 | 70 | 71 | 32 | 51 | 77 | 46 | 58 | 56 | 55 | 33 | 26-03 | 06 | 51 | 10 | 19 | 03 | | | 250.5 | 34.54 |
| NV5 | | | | | | | 81 | 86 | 75 | 46 | 60 | 54 | 45 | 69 | 73 | 25 | 41 | 72 | 53 | 57 | 61 | 62 | 40 | 35 | 11 | 13 | 59 | 14 | 20 | 07 | | | 247.4 | 29.78 |
| NV6 | | | | | | | | 81 | 61 | 33 | 44 | 46 | 44 | 55 | 56 | 39 | 41 | 63 | 33 | 60 | 67 | 78 | 28 | 17 | 12 | 27 | 64 | 15 | 43-01 | | | 264.6 | 52.88 |
| NV7 | | | | | | | | | 74 | 55 | 28 | 26 | 26 | 49 | 54 | 43 | 51 | 56 | 39 | 57 | 62 | 63 | 24 | 36 | 17 | 31 | 66 | 36 | 44 | 30 | | | 225.7 | 51.15 |
| NVT | | | | | | | | | | 49 | 34 | 37 | 23 | 48 | 44-02 | 38 | 46 | 36 | 74 | 76 | 68 | 09 | 06 | 19 | 09 | 61 | 27 | 39 | 18 | | | 453.1 | 62.11 |
| QA1 | | | | | | | | | | | 03 | 12-06 | 34 | 28 | 01-10 | 09 | 21 | 38 | 52 | 44-22 | | 43 | 27 | 36 | 57 | 65 | 18 | 67 | | | | 2.3 | 4.91 |
| | | | | | | | | | | NV1 | 86 | 85 | 79 | 64 | 06 | 10 | 80 | 33 | 54 | 44 | 41 | 50 | 31-10-24 | | 34-10-07-02 | | | | | | | 290.4 | 28.85 |
| | | | | | | | | | | NV2 | | 85 | 72 | 57-06-04 | | 70 | 37 | 49 | 47 | 39 | 30 | 18-11-24 | | 29-01-03-11 | | | | | | | 279.3 | 28.09 |
| | | | | | | | | | | NV3 | | | 75 | 68 | 23 | 23 | 84 | 34 | 43 | 37 | 31 | 30 | 25-11-16 | | 27-14 | 00-24 | | | | | 273.5 | 18.47 |
| | | | | | | | | | | NV4 | | | | 87 | 30 | 30 | 88 | 31 | 61 | 61 | 54 | 42 | 41-04 | 05 | 55 | 05 | 05-08 | | | | 263.9 | 22.51 |
| | | | | | | | | | | NV5 | | | | | 37 | 49 | 88 | 60 | 39 | 50 | 43 | 46 | 47 | 11 | 16 | 49 | 01 | 13-06 | | | 256.4 | 20.02 |
| | | | | | | | | | | NV6 | | | | | | 64 | 49-11 | 23 | 16 | 27 | 35 | 32 | 09 | 24 | 34 | 02 | 23 | 08 | | | 290.3 | 20.69 |
| | | | | | | | | | | NV7 | | | | | | | 59 | 20 | 37 | 36 | 39 | 32-05-09 | | 01 | 25-09 | 22-14 | | | | | 248.8 | 41.03 |
| | | | | | | | | | | NVT | | | | | | | | 40 | 61 | 58 | 54 | 53 | 32-06-06 | | 48-05 | 12-17 | | | | | 475.5 | 32.52 |
| | | | | | | | | | | QA2 | | | | | | | | -05 | 14 | 03 | 14 | 24 | 19 | 09 | 12-10 | 00-12 | | | | | 1.6 | 3.06 |
| | | | | | | | | | | | | | | | | | | | NV1 | 91 | 88 | 27 | 12 | 04 | 01 | 74 | 40 | 40 | 16 | | | 287.3 | 38.52 |
| | | | | | | | | | | | | | | | | | | | NV2 | | 93 | 26 | 18 | 12 | 16 | 81 | 54 | 46 | 26 | | | 281.9 | 31.34 |
| | | | | | | | | | | | | | | | | | | | NV3 | | | 30 | 14 | 12 | 22 | 80 | 45 | 51 | 14 | | | 273.3 | 21.09 |
| | | | | | | | | | | | | | | | | | | | NV4 | | | | 42 | 12 | 09 | 39 | 04 | 18-19 | | | | 243.5 | 22.55 |
| | | | | | | | | | | | | | | | | | | | NV5 | | | | | 62 | 56 | 60 | 45 | 36 | 44 | | | 241.0 | 17.30 |
| | | | | | | | | | | | | | | | | | | | NV6 | | | | | | 73 | 56 | 32 | 64 | 36 | | | 279.5 | 22.95 |
| | | | | | | | | | | | | | | | | | | | NV7 | | | | | | | 61 | 40 | 55 | 30 | | | 243.3 | 39.98 |
| | | | | | | | | | | | | | | | | | | | NVT | | | | | | | | 62 | 66 | 38 | | | 463.7 | 35.06 |
| | | | | | | | | | | | | | | | | | | | QA3 | | | | | | | | | 45 | 84 | | | 2.8 | 3.60 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | NVT | 30 | | | 468.5 | 27.30 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | QA4 | | | | 3.5 | 4.21 |

TABLE 3-2

CORRELATION COEFFICIENTS

Nonverbal Practice Treament

Underlined Significant at the .05 level

( n= 17 )

| | SEX | NV1 | NV2 | NV3 | NV4 | NV5 | NV6 | NV7 | NVT | QA1 | NV1 | NV2 | NV3 | NV4 | NV5 | NV6 | NV7 | NVT | QA2 | NV1 | NV2 | NV3 | NV4 | NV5 | NV6 | NV7 | NVT | QA3 | NVT | QA4 | MEAN | STD DEV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SEX | | 61 | 39 | 41 | 32 | 21 | 25 | 11 | 34 | 19 | 69 | 63 | 40 | 12-12-10-31 | | 32 | 46 | 58 | 34 | 39 | 14 | 06 | 03-04 | 31 | 26 | 33 | 32 | | | | 1.5 | 0.51 |
| NV1 | | | 38 | 22 | 28 | 24 | 19 | 10 | 26-04 | 59 | 54 | 26 | 24-02-01-16 | | 32 | 41 | 47 | 09 | 09-02-01 | | 02 | 01 | 14 | 59 | 51 | 37 | | | | 247.3 | 36.20 |
| NV2 | | | | 89 | 69 | 60 | 48 | 44 | 77 | 59 | 60 | 85 | 88 | 56 | 34 | 27 | 01 | 74 | 10 | 48 | 67 | 64 | 38 | 22 | 26 | 25 | 56 | 51 | 52 | 65 | | 258.1 | 35.14 |
| NV3 | | | | | 80 | 71 | 61 | 59 | 86 | 56 | 55 | 78 | 85 | 61 | 54 | 48 | 22 | 84 | 05 | 32 | 61 | 62 | 57 | 38 | 47 | 38 | 66 | 30 | 58 | 58 | | 253.9 | 27.68 |
| NV4 | | | | | | 95 | 79 | 85 | 94 | 47 | 48 | 56 | 68 | 58 | 59 | 49 | 26 | 73 | 15-02 | | 33 | 38 | 54 | 49 | 59 | 59 | 57 | 40 | 55 | 55 | | 231.1 | 37.07 |
| NV5 | | | | | | | 79 | 85 | 90 | 43 | 35 | 41 | 59 | 68 | 71 | 62 | 44 | 74 | 11-19 | | 23 | 30 | 62 | 64 | 72 | 76 | 62 | 44 | 57 | 55 | | 233.4 | 31.29 |
| NV6 | | | | | | | | 85 | 85 | 29 | 32 | 35 | 47 | 52 | 58 | 49 | 36 | 62 | 20-09 | | 24 | 31 | 50 | 65 | 75 | 68 | 61 | 36 | 50 | 48 | | 249.4 | 52.10 |
| NV7 | | | | | | | | | 85 | 26 | 21 | 28 | 45 | 48 | 62 | 62 | 42 | 60 | -11-30 | | 09 | 16 | 40 | 52 | 63 | 65 | 45 | 25 | 27 | 34 | | 217.1 | 57.15 |
| NVT | | | | | | | | | | 58 | 48 | 61 | 73 | 62 | 59 | 51 | 27 | 77 | 13 | 07 | 46 | 50 | 59 | 55 | 66 | 62 | 69 | 45 | 56 | 65 | | 424.8 | 56.97 |
| QA1 | | | | | | | | | | | 18 | 34 | 48 | 27 | 19 | 08-01 | | 32 | 16 | 29 | 60 | 52 | 53 | 28 | 33 | 31 | 57 | 46 | 41 | 73 | | 0.4 | 0.79 |
| | | | | | | | | | | NV1 | | 78 | 66 | 31 | 06-08-29 | | | 52 | 37 | 54 | 36 | 37 | 04-02 | | 00-11 | | 17 | 18 | 41 | 32 | | 273.3 | 47.87 |
| | | | | | | | | | | NV2 | | | 85 | 44 | 14 | 02-26 | | 64 | 29 | 64 | 65 | 63 | 24 | 09 | 12 | 02 | 44 | 36 | 38 | 46 | | 267.5 | 41.48 |
| | | | | | | | | | | NV3 | | | | 67 | 47 | 21 | 00 | 79 | 09 | 30 | 52 | 53 | 24 | 17 | 25 | 15 | 41 | 26 | 40 | 50 | | 259.5 | 32.32 |
| | | | | | | | | | | NV4 | | | | | 87 | 65 | 60 | 90 | 10-18 | | 11 | 21 | 38 | 40 | 49 | 55 | 41 | 23 | 51 | 33 | | 240.1 | 29.89 |
| | | | | | | | | | | NV5 | | | | | | 81 | 82 | 81 | -12-48 | -09 | 00 | 42 | 44 | 06 | 04 | 32 | 24 | 38 | 15 | | 236.7 | 28.76 |
| | | | | | | | | | | NV6 | | | | | | | 90 | 69 | -37-44 | -17 | -11 | 44 | 43 | -21-37 | | 27 | 34 | 26 | 36 | | 263.0 | 42.72 |
| | | | | | | | | | | NV7 | | | | | | | | 53 | -25-59 | -32 | -23 | 35 | 36 | 23 | 15 | 75 | 36 | 28 | 55 | | 229.7 | 47.11 |
| | | | | | | | | | | NVT | | | | | | | | | 04 | 03 | 25 | 31 | 43 | 36 | 24 | 22 | 76 | 29 | 29 | 49 | | 441.8 | 44.99 |
| | | | | | | | | | | QA2 | | | | | | | | | | 40 | 35 | 43 | 26 | 18 | 79 | 72 | 91 | 31 | 53 | 49 | | 2.9 | 2.98 |
| | | | | | | | | | | | | | | | | | | | NV1 | 66 | 56 | 06-13 | 88 | 86 | 84 | 43 | 36 | 50 | | 280.9 | 31.47 |
| | | | | | | | | | | | | | | | | | | | NV2 | | 96 | 59 | 37 | 83 | 76 | 37 | 51 | 51 | 50 | | 265.8 | 29.50 |
| | | | | | | | | | | | | | | | | | | | NV3 | | | 61 | 43 | 88 | 86 | 84 | 43 | 36 | 50 | | 266.2 | 19.38 |
| | | | | | | | | | | | | | | | | | | | NV4 | | | | 80 | 47 | 48 | 21 | 61 | 38 | 49 | | 244.2 | 23.95 |
| | | | | | | | | | | | | | | | | | | | NV5 | | | | | 88 | 86 | 84 | 43 | 36 | 50 | | 236.6 | 25.13 |
| | | | | | | | | | | | | | | | | | | | NV6 | | | | | | 83 | 76 | 37 | 51 | 51 | | 268.0 | 39.37 |
| | | | | | | | | | | | | | | | | | | | NV7 | | | | | | | 70 | 46 | 36 | 46 | | 232.7 | 49.04 |
| | | | | | | | | | | | | | | | | | | | NVT | | | | | | | | 53 | 51 | 66 | | 446.8 | 38.80 |
| | | | | | | | | | | | | | | | | | | | QA3 | | | | | | | | | 46 | 82 | | 2.8 | 4.19 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | NVT | 63 | | 451.0 | 39.23 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | QA4 | | | 4.2 | 4.26 |

TABLE 3-3

CORRELATION COEFFICIENTS

Question Practice Treatment

Underlined Significant at the .05 level

( n= 17 )

TABLE 3-4
Nonverbal Practice Group
Stepwise Multiple Regression Results

To Predict Nonverbal Total Score Session 4

| Step | Session | Variable | $R^2$ | Standard Beta | F |
|---|---|---|---|---|---|
| 1. | 3 | Nonverbal Total | 44 | -4.37 | 12.1** |
| 2. | 1 | Head Motion | 59 | 2.16 | 10.3** |
| 3. | 1 | Questions Asked | 63 | -0.12 | 7.4** |
| 4. | 3 | Body Posture | 67 | 0.87 | 6.1* |
| 5. | 1 | Directed Arm-Hand-Finger Motion | 71 | 2.91 | 5.6* |
| 6. | 3 | Questions Asked | 73 | -0.10 | 4.7* |
| 7. | 3 | Arm-Hand-Finger Motion | 77 | 2.40 | 4.4* |

To Predict Question Asking Score Session 4

| | | | | | |
|---|---|---|---|---|---|
| 1. | 3 | Questions Asked | 71 | 1.34 | 37.1*** |
| 2. | 3 | Head Motion | 78 | 0.10 | 25.0*** |
| 3. | 1 | Questions Asked | 83 | 0.28 | 21.6*** |
| 4. | 2 | Arm-Hand-Finger Motion | 85 | 0.77 | 18.4*** |
| 5. | 1 | Nonverbal Total | 88 | 1.05 | 16.2*** |
| 6. | 2 | Questions Asked | 90 | -0.31 | 15.3*** |
| 7. | 3 | Nonverbal Total | 91 | -1.61 | 13.0*** |

* = significant at the .05 level
** = significant at the .01 level
*** = significant at the .001 level

TABLE 3-5
Question Practice Group
Stepwise Multiple Regression Results

To Predict Nonverbal Total Score Session 4

| Step | Session | Variable | $R^2$ | Standard Beta | F |
|---|---|---|---|---|---|
| 1. | 2 | Nonverbal Total | 37 | -0.07 | 9.0** |
| 2. | 2 | Questions Asked | 50 | -0.06 | 7.1** |
| 3. | 3 | Questions Asked | 57 | -0.11 | 5.6* |
| 4. | 2 | Head Motion | 61 | -0.56 | 4.8* |
| 5. | 1 | Head Motion | 65 | 1.47 | 4.2* |

To Predict Questions Asked Session 4

| | | | | | |
|---|---|---|---|---|---|
| 1. | 3 | Questions Asked | 68 | 1.33 | 33.0*** |
| 2. | 1 | Questions Asked | 84 | 0.10 | 37.7*** |
| 3. | 1 | Head Motion | 87 | 1.22 | 30.0*** |
| 4. | 1 | Facial Motion | 88 | -0.48 | 23.0*** |
| 5. | 2 | Arm-Hand-Finger Motion | 89 | -1.87 | 19.5*** |
| 6. | 2 | Questions Asked | 91 | -0.63 | 18.8*** |
| 7. | 2 | Directed Arm-Hand-Finger Motion | 93 | 1.42 | 19.5*** |

* = significant at the .05 level
** = significant at the .01 level
*** = significant at the .001 level

marginal number of students available ( n=17 per treatment group ) for this kind of analysis. Thus, these results must be considered only suggestive of possible relationships and prediction formulae weighting must be tested on other, hopefully, larger populations before the regression weights can be considered confirmed.

When looking at one treatment against the other treatment across one criterion measure a significantly nonparallel relationship was found ( $P < .05$ ). Referring to Figure 3-1 ( Parallelism of Regression between Body Posture Session 3 and Question Asked Final Score ) students in the Nonverbal Practice Group showed a correlation of $r = -.20$ between the score on "Body Posture" at the third session and the score on the number of questions asked at the final session. For the students in the Question Practice Group the relationship between these two scores was $r = .50$. It seems that students who were active on the nonverbal skill of "Body Posture" at session three of the Nonverbal Treatment Group exhibited a decrease in question asking on the final presentation. Whereas, students who were active on the nonverbal skill of "Body Posture" at session three of the Question Practice Group exhibited an increase in their question asking at session four.

When looking at one criterion measure against the

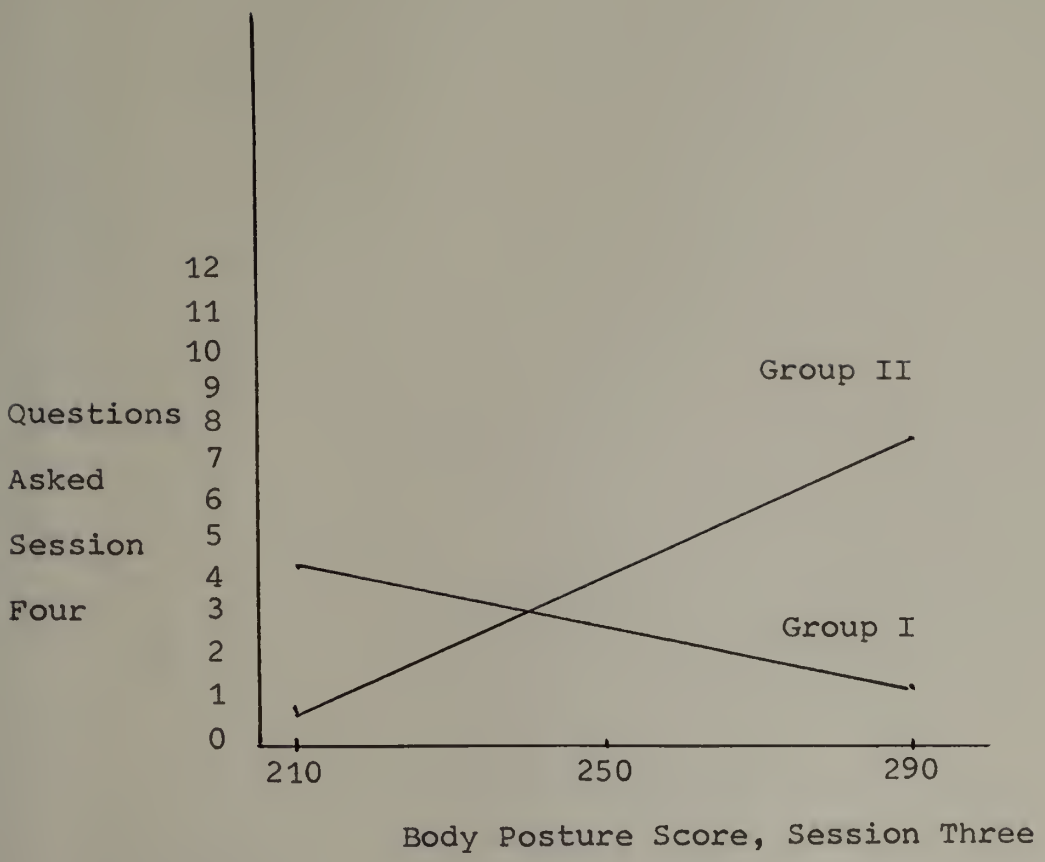



Figure 3-1

Parallelism of Regression

other criterion measure across one treatment group, a significantly nonparallel relationship was found ( $P < .01$ ) for the Nonverbal Treatment Group session three on the variable "Arm-Hand-Finger Motion" such that there was a strong direct correlation with the nonverbal criterion but less so with the question asking criterion. In reference to the nonverbal versus question asking criteria for the Question Practice Treatment Group there were a series of significant nonparallel relationships such that people who do well initially across all but one of the nonverbal measures do well finally on the nonverbal criteria but not necessarily equally as well on question asking. In other words, the question asking treatment maintains relatively the same rank order in reference to the nonverbal behavior but not in terms of question asking.

## Secondary Data Analysis

The basic premise of a communicative study in the area of nonverbal communication is that the messages of the sender are consistently received by the raters ( without regard to the correctness of the interpretation by the raters ). Therefore the Hotelling $T^2$ statistic and profile analysis was again used to examine rater consistency. Referring to Appendix J ( Profile Analysis Rater Data ), it must be noted that a limitation of this

statistic is that it can only compare two groups simultaneously over multivariables. Therefore, the raters were grouped by sex. From inspection of the profiles it can be seen that they appear to be similar. Using session two as representative, the statistics indicate that both groups are parallel and rate at significantly different levels ( .05 with an F= 5.85 ), the females rating consistently higher than the males. The exception to this is on the variable "Directed Arm-Hand-Finger Motion" in which the men consistently rated higher than the women.

Student Course Evaluation

At the conclusion of the course students were administered an evaluation which asked them to rate and comment on the various components and experiences. While the ratings cannot be analysed statistically because of the general orientation of the questions, it is worthwhile to mention that the impression of the students to the microteaching experience was favorable. Some of the students indicated that they felt a growth in the self-confidence.

# C H A P T E R IV

## CRITIQUE AND IMPLICATIONS

In this chapter, findings will be summarized and critiqued, and implications of the findings will be discussed.

### Summary of the Findings

This study focused on training student teachers in the use of nonverbal skills. Training was defined as both the presentation of information and the opportunity for practice. The control group would be thought of as receiving just the informational component and practice on a different skill "questioning".

It was hypothesized that when beginning teachers 1) received information on nonverbal skills and questioning skills in the same session and, 2) were encouraged to practice one of the skills, their performance at subsequent microteaching sessions would increase in the practiced skill greater than the unpracticed. It was also hypothesized that the students overall performance on both skills would increase from the start of the microteaching experience to its conclusion. These hypotheses were not supported by the experimental evidence. A third hypothesis that there are differential predictors of student teacher outcomes based

on interaction between various aptitude measures and instructional treatments since indicators of statistically significant individual differences in learning from the several treatment conditions were found. "Body Posture" display in session three was negatively related to final question asking criterion for the Non-verbal Practice Treatment Group while strongly positively related for the Question Practice Treatment Group. The Nonverbal Practice Treatment Group were differentially related to the two criterion measures in terms of the variable "Arm-Hand-Finger Motion".

The strongest individual differences occurred in the Question Practice Treatment Group with a strong positive relationship on all but one of the nonverbal variables session one, and slightly fewer of these variables in session two and three and the nonverbal criterion and a not so strongly positive relationship with the question asking criterion.

Alternative plausible explanations must be considered pending further research:

a) the assumption of randomness may not be true. There may be the possibility that because students elect to take the course from which the sample is drawn and further, the students elect the microteaching component-this self-selection process produces a group of subjects

with a high nonverbal to question asking ratio.

b) Multiple-Treatment Interference: as all subjects received information about both sets of skills, and later ( session 3 ) were expected to attempt a "neutral" skill there may be an interference effect between the skills such that crossing over occurs. As indicated above this effect may manifest itself in acting as an inhibiting factor by forcing students who might be active nonverbally to concentrate on question asking and thus restrict their nonverbal actions. The trend on the student data seems to point to the skill of "set induction" as inhibiting both nonverbal and question asking skills and thus may be acting not as a "neutral" task but indeed a blocking agent.

c) Hawthorne Effect: usually refers to the subject being aware that they are part of an experiment and altering his behaviors to preconceived notions of performance. As the students were not aware that they were subjects in a study ( this being a component of a course ) it is assumed that this effect is minimal.

d) Novelty and Disruption Effects: probably would contribute a great deal to the lack of significance in this study. One of the notions of the microteaching procedure is that the student requires time to get use to seeing himself on video-tape, relax in the

environment of the camera and the slightly forced setting of a clinic. This "cosmetic" effect is assumed to be overcome in the initial presentation. Thus one would expect a difference between the first two sessions and the first and last sessions. The data indicates these trends but not at significant levels. Therefore one might suggest a longer period of time is needed for students to "feel" ready to try on new behaviors.

e) Interaction of Time of Measurement and Treatment Effects: the measurement of the dependent variable at two different times may produce different results. Thus the scores and trends observed after the practice session ( number two ) and the scores observed later may be the result of learning-forgetting effects of students and imply the need for repetition to significantly raise score levels.

f) The treatment was not powerful in the training of beginning student teachers. It has been stated previously that the students appeared to react favorably to the microteaching experience. There is, of course, no real way of telling just how effective the training was, or could be, particularly for these students for whom this was their first collegiate exposure to teaching.

## Modification of the Study

In the analysis of the present study, each component was critiqued, and possible refinements sought. Those refinements constitute the basis for a study similar in intention to the present one, but which is more likely to produce substantive findings, since it will avoid the pitfalls in the present study.

In this section, the key features of a redesigned study will be presented.

Sample Size

In addition to increasing the sample size, it is suggested that the treatment groups be more isolated in their training. Thus a design which would have a separate sample for nonverbal practice, question asking practice, nonverbal information presentation, and question asking information presentation is suggested. This implies the need for appropriate statistical tools to examine multivariate analysis of multiple groups across time.

Information on Subject Predictors

To gain further insight into the precursor factors of students prior to and their relationship to performance in nonverbal use, attitudinal, and environmental ( demographic, standardized test scores, etc. ) should be obtained prior to the study. This information may be of value in stratification of the sample populations

across the treatment groups.

Elimination of "Neutral" Task

The present data indicates the use of "Set Induction" seems to "inhibit" gains in both nonverbal and questioning skills. To allow greater time for "cosmetic" effects and additional repetition of the practiced skill, the third session should be focused on the skills under study.

Observation Measures- Context

The Instrument for the Systematic Observation of Nonverbal Behaviors looks at subjects physical nonverbal use, context free. Question asking refers to verbal inflection or sentence structure for coding. Previous studies ( Victoria, 1970 ) have found the instrument useful in limited contexts ( lecture, demonstration, discussion ) where evaluation was done by settings. Greater differences may be observed by limiting or focusing the use of the instrument into a context frame. While this places a bounds on the notion that nonverbal behaviors are adaptable to different contexts, this simplification in design may indicate areas of weakness or strengths in the measures which will permit redesign to a context free environment.

## Implications for Research

The study has focused on the training of beginning teachers. Two basic directions emerge from this investigation. The first follows directly from the thrust of this study -- to training teachers in a microteaching setting. The second involves the entire area of nonverbal communication.

With today's decreasing demand for teachers and the resulting increased selectivity of schools for teachers who demonstrate practiced skills, the area of microteaching offers the possibility of permitting extensive, detailed experience that traditional teacher education programs lack. Specifically, the traditional teacher education program has students attempt to "put together" all of their theoretical training in a one semester of on site "live" teaching. In most cases this live teaching consists of watching an experienced teacher for a period of time, then the student attempts to duplicate the behaviors seen. Feedback consists of the model teachers impressions. Microteaching offers the student teacher the opportunity to practice skills continually throughout their collegiate experience and not only when on site. In addition the feedback available through the use of the video-tape permits evaluation and modeling of more than one teacher. Thus research in the area of microteaching for beginning teachers should be

focusing on extending the sessions over the undergraduate experience in such a way to maintain gains in skills while adding additional skills to the students background. A bonus of this approach, is the the reduction of "cosmetic" effects to the television camera and the gradual realization of its use as an instructional tool. The expansion of microteaching into the area of in-service training is a parallel argument to the above.

The second direction, that of nonverbal communication, involves several research thrusts. Primarily this study deals with nonverbal communication on an individual physical level. Therefore, in addition to further refinement of the categories as discriminators of differences in the use of physical nonverbal communication, the possibility for evaluating the relationship between verbal inflection and physical nonverbal communication in a classroom setting or microteaching setting would be appropriate. Another area of nonverbal communication would be in the sensitizing of teachers to the use of space and time as communication mediums. Thus, basic research into the definition of the use of space and time, their relationship to verbal communication in the classroom, and their effects on student learning appears desirable for future studies.

# APPENDIX A

# MICROTEACHING:

# WHAT IT IS AND WHAT IT DOES

MICROTEACHING: What it is and What it does

What Microteaching is

An observer might describe microteaching as follows: A teacher instructs 4 or 5 students for a short period of time and then talks it over with another adult. The teacher concentrates on a specific training skill or technique and utilizes several sources of feedback, such as supervisor, the students, the teacher's own reflections and the playback of videotapes. The teacher has the opportunity to repeat the entire process by reteaching the lesson and again having his or her performance critiqued.

Fundamentally microteaching is an idea, at the core of which lie 5 essential propositions:

1) Microteaching is real teaching. Although the teaching situation is a constructed one in the sense that the teacher and students work together in a practice situation,nevertheless, bonafide teaching does take place.

2) Microteaching lessons the complexities of normal classroom teaching. Class size, scope of content, and time are all reduced.

3) Microteaching focuses on training for the accomplishment of specific tasks. These tasks may be practice of instructional skills, the practice of techniques of teaching, the mastery of certain curricular materials, or the demonstration of teaching methods.

4) Microteaching allows for the increased control of practice. In the practice setting of microteaching, the rituals of time, students, methods of feedback and supervision, and many other factors can be manipulated. As a result, a high degree of control can be built into the training program.

5) Microteaching greatly expands the normal knowledge-of-results or feedback dimension in teaching.

What Microteaching does

To train teachers initially and then to maintain their professional skill through a lifetime of service.

Safe Practice

As one teacher said: "Microteaching has added

> real meaning to our courses in educational psychology and sociology because we get an opportunity to practice what the courses preach". Practice is a prerequisite for many learning activities. Much of a teacher's day is devoted to activities that are learned and can be improved through practice. Micro-teaching was designed to provide teachers with a safe setting for the acquisition of the techniques and skills of their profession. Both groups- beginners and experienced teachers- find microteaching a safe, realistic setting in which to develop professional competences.

How microteaching works

Microteaching is a scaled down practice lesson in which the teacher teaches for a short period of time ( 5 minutes ), to a small groups of students ( 4 - 6 ), on some topic in his teaching subject.

The purpose of the practice sessions is to change teacher perceptions of their own teaching behavior, and to provide training for specific training skills.

Individual lessons are 5 minutes long and are planned and taught by the teacher, critiqued, the replanned and retaught to a group of pupils.

> 5 minute lesson
> 5-10 minute viewing and critique
> time to replan
> 5 minute lesson ( cycle begins again )

Within four sessions the beginning teacher can gain insight into some of the basic skills of teaching and evaluate personal needs for further learning in time to modify their course of study.

What are the technical skills of teaching

The following pages outline the technical skills of teaching so far explored in microteaching settings. These skills are not self-exclusive or all encompassing but are relatively definable and combinable into complex teaching forms.

As most pre-service teachers have prior to entering a program of teacher education been students for an extended period of time, the likelihood that the major teaching model has been the classroom teacher who lectures. Therefore, for the initial microteaching experience it is suggested that the teacher prepare a five minute lesson on any topic of their choosing and present this in a lecture mode.

## TECHNICAL SKILLS OF TEACHING

### 1. ESTABLISHING SET

The term set refers to the establishment of cognitive rapport between pupils and teacher to obtain immediate involvement in the lesson. Experience indicates a direct relationship between the effectiveness in establishing set and effectiveness in the total lesson. If the teacher succeeds in creating a positive set, the likelihood of pupil involvement in the lesson will be enhanced. For example, one technique for including positive set is through the use of analogies that have characteristics similar to the concepts, principle, or central theme of the lesson. By training teachers in set induction procedures and having them apply these procedures in microteaching sessions, their subsequent classroom teaching can be significantly improved.

### 2. ESTABLISHING APPROPRIATE FRAMES OF REFERENCE

A student's understanding of the material of a lesson can be increased if it is organized and taught from several appropriate points of view. A single frame of reference provides a structure through which the student can gain an understanding of the materials. The use of several frames of reference deepens and broadens the general field of understanding more completely than is possible with only one. For example, the Emancipation Proclamation becomes more meaningful to the student when it is understood from the frames of reference of the Northern white abolitionist, the Southern white, the Negro slave in the seceded South, the free Negro, the European clothing manufacturer, the political leaders of England, and as an example of the reserve powers of the American President, than if it is simply discussed as the document issued by Lincoln which freed the slaves. Teachers can be trained to become more powerful teachers as they are taught to identify many frames of reference that might be used in instruction, to make judicious selection from among them, and then to present them effectively.

### 3. ACHIEVING CLOSURE

Closure is complementary to set induction. Closure is attained when the major purpose, principles, and constructs of a lesson, or portion of a lesson, are judged to have been learned so that the student can relate new knowledge to past knowledge. It is more than a quick summary of the ground covered in a lesson. In addition to pulling together the major points and acting as a cognitive link between past knowledge and new knowledge, closure provides the pupil with a needed feeling of achievement. Closure is not limited to the completion of

a lesson. It is also needed at specific points within the lesson so that pupils may know where they are and where they are goining.

4. RECOGNIZING AND OBTAINING ATTENDING BEHAVIOR (Visual cues )

Teachers can be trained to become more sensitive to the classroom behavior of pupils. The successful experienced teacher, through visual cues, quickly notes indications of interest or boredom, comprehension or beweilderment. Facial expressions, directions of the eyes, the tilt of the head, and bodily posture offer commonly recurrent cues which make it possible for the skilled teacher to evaluate his classroom performance according to pupil reactions. He can then change his "pace," vary the activity, introduce new instructional strategies as necessary, and improve the quality of his teaching. Unlike his more experienced counterpart, the beginning teacher has difficulty perceiving and interpreting these visual cues. Through 16mm motion picture films and 35mm still picture protocols of classrooms, and videotape recordings in microteaching sessions, supervisors are able to sensitize teachers to visual cues of pupil's attending and non-attending behavior.

5. PROVIDING FEEDBACK

The feedback process in the training of teachers may be simply stated as providing "knowledge of results." Teachers often ignore the availability if information accessible during the lesson. Questioning, visual cues, informal examination of performance, are immediate sources of feedback. Teachers can be taught appropriate techniques to ellicit feedback from students to modify their lessons accordingly. Teachers unconsciously tap a variety of feedback sources but unless they are sensitized, they tend to rely unevenly on a limited number of students as "indicators" and to rely on a restricted range of feedback cues.

6. EMPLOYING REWARDS AND PUNISHMENTS ( REINFORCEMENT )

Reinforcing desired pupil behavior through the use of reward and punishment is an integral part of the teacher's role as director of classroom learning. Substantial psychological evidence confirms the value of reinforcement in the learning process. The acquisition of knowledge of specific techniques of reward and punishment and the development of skill in using them approproately in specific situations is most important in training a beginning teacher. Experience indicates that teachers can acquire skill through microteaching practice in reinforce-

ment of pupil learning.

7. CONTROL OF PARTICIPATION

Microteaching sessions enable teachers to analyze the kinds of pupil-teacher interaction which characterize their teaching. Control of pupils' participation is one important variable in the successful learning for the pupils. Micro-teaching sessions provide an opportunity for teachers to practice different techniques for encouraging or discouraging classroom interaction and to gain insight into the casual relationship between a series of teacher-pupil interactions. When a teacher develops the skill to analyze and to control the use of his accepting and rejecting remarks, his positive and negative reactions, his patterns of reward and punishment, he has taken a major step toward effective teaching.

8. REDUNDANCY AND REPETITION

The purpose of this skill is to clarify and reinforce major ideas, key words, principle, and concepts in a lecture or discussion. The use of redundancy and repetition is a powerful technique in focusing and highlighting important points, and describing them from a different point of view. Improper use of this skill can cause confusion and poor learning among the students, while proper use can direct their attention to points which the teacher wishes to emphasizing. There are two main varieties of repetition: 1. Literal repetition-using simple, massed, distributed, and accumulative repetition; and 2. figures of speech-metaphors, analogies, verbal emphasis, focusing, gestures, and visual highlighting.

9. ILLUSTRATING AND USE OF EXAMPLES

The use of examples is basic to teaching for good, sound, clear teaching. Examples are necessary to clarify, verify, or substantiate concepts. Both inductive and deductive uses of examples can be used effectively by the teacher. Effective use of examples includes: 1. starting with simple examples and progressing to more complex ones; 2. starting with examples relevant to students' experience and knowledge; 3. relating the examples to the principles or ideas being taught; 4. checking to see if the objectives of the lesson have been achieved by asking students to give examples which illustrate the main point.

10. ASKING QUESTIONS

Too often teachers lecture and tell students rather than asking questions which can elicit the answers from the

students themselves. Training techniques have been developed by which teachers can see model videotapes of teachers demonstrating this skill, and by practicing in a microteaching situation increase the number of questions which they ask of students. Having achieved this goal the emphasis can then be placed on higher order questioning techniques.

11. THE USE OF HIGHER ORDER QUESTIONS

Higher order questions are defined as questions which cannot be answered from memory or simple sensory description. They call for finding a rule or principles rather than defining one. The critical requirements for a "good" classroom question is that it prompts students to use ideas rather than just remember them. Although some teachers intuitively ask questions of high quality, far too many over emphasize those that require only the simplest cognitive activity on the part of the students. Procedures have been designed to sensitize beginning teachers to the effects of questioning on their students and to provide practice in forming and using higher order questions.

12. THE USE OF PROBING QUESTIONS

Probing requires that teachers ask questions that require pupils to go beyond superficial "first-answer" questions. This can be done in five ways: 1. asking pupils for more information and/or more meaning; 2. requiring the pupil to rationally justify his response; 3. refocusing the pupil's or class's attention on a related issue; 4. prompting the pupil or giving him hints; and 5. bringing other students into the discussion by getting them to respond to the first student's answer.

13. TEACHER SILENCE

Many teachers are frightened by silence or pauses in classroom discussion. They usually hasten to fill silence gaps by talking. What many teachers do not realize is that teacher silence is a powerful tool in the classroom. Teacher pausing can be used after: 1. Introductory statements to pressure the students into thinking about the teacher's statement; 2. questions to the students to give them time to think about a proper answer; 3. questions from the students to direct the question to another student with a look or gesture; 4. student response to elicit a continuing response.

14. NON-VERBAL CUES

Smiles, frowns, glances, nods of the head, movement of the hands, feet, and body transmit information to the student on the intentions or emphasis of the teacher. Most beginning teachers tend to be rigid in posture and restrictive in the vocabulary of nonverbal communication. Through video-tape feedback teachers can be sensitized to the nonverbal domain and practice can increase the congruence between the verbal and nonverbal modes of communication. An experienced teacher is able to guide a discussion almost totally by the use of nonverbal gestures , through practice beginning teachers can develop techniques of reducing teacher visibility and increasing student participation.

15. COMPLETENESS OF COMMUNICATION

Although the importance and need for clear communication is blatant, it is not often the guiding principle in actual communication. Sensitivity training on the importance, and the difficulty, of being understood is the focus of this skill. Several classroom games have been devised which dramatically demonstrate to teachers that what they consider to be clear instructions are often not clear at all to the students. Sensitivity training in the skill of communicating with others will produce teachers who are more responsive to possible miscommunication.

INTEGRATIVE SKILLS

The following are classified as integrative skills because they consist of combinations of other skills. Mastery of the separate skills is not enough to produce the overall desired behavior. For this reason new skills are listed which consist largely of other skills in a different context.

16. VARYING THE STIMULUS SITUATION

Psychological experiments have shown that deviations from standard, habitual teacher behavior result in higher pupil attention levels. Teachers should be sensitized to their habit patterns and made aware of attention producing behavior that they, as the stimulus object, can control. The behaviors include teacher movement, gestures, focusing pupil attention, varying the interaction styles, pausing, and shifting sensory channels.

17. LECTURING

Training in some of the successful techniques of

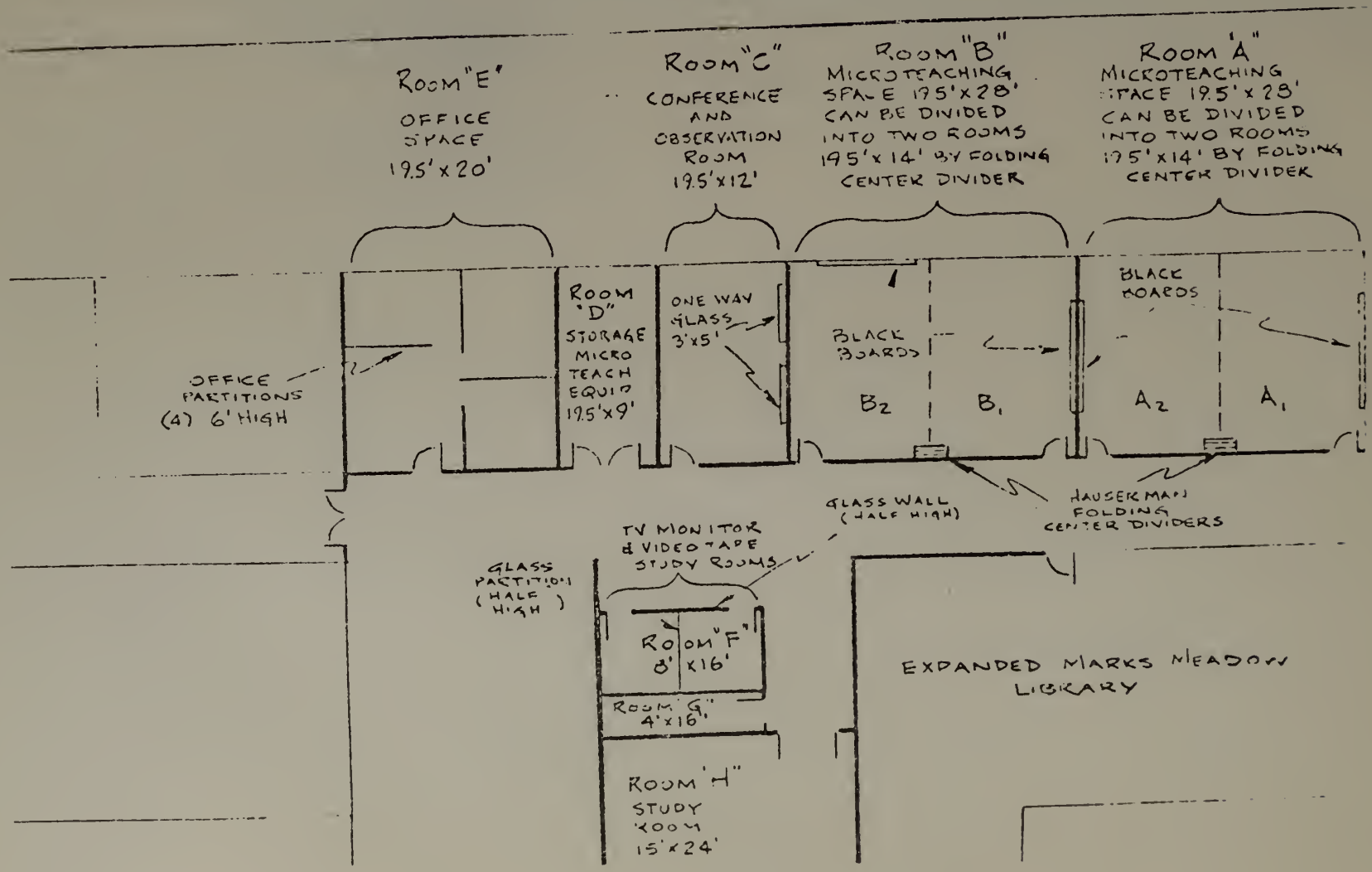
lecturing based upon a communication model is the focus for this skill. Delivery techniques, use of audio-visual materials, set induction, pacing, closure, redundancy and repetition, and other skills related to lecturing are included.

18. PRE- CUEING

Pupils are often called on in class to answer questions. Frequently the student does not know the answer and either wastes class time talking in circles, or else admits ignorance. The teacher could cue the student 5 or 10 minutes ahead so the student could prepare himself, thus making a significant contribution to the class. The alerting or cueing of students is a teacher technique which can be used to good purpose in the classroom.

# APPENDIX B

# DIAGRAM OF MICROTEACHING FACILITY


ROOM "E"
OFFICE SPACE
19.5' x 20'
ROOM "C"
CONFERENCE AND OBSERVATION ROOM
19.5' x 12'
ROOM "B"
MICROTEACHING SPACE 19.5' x 28'
CAN BE DIVIDED INTO TWO ROOMS
19.5' x 14' BY FOLDING CENTER DIVIDER
ROOM 'A"
MICROTEACHING SPACE 19.5' x 28'
CAN BE DIVIDED INTO TWO ROOMS
19.5' x 14' BY FOLDING CENTER DIVIDER
OFFICE PARTITIONS (4) 6' HIGH
ROOM "D" STORAGE MICRO TEACH EQUIP 19.5' x 9'
ONE WAY GLASS 3' x 5'
BLACK BOARDS
B2
B1
BLACK BOARDS
A2
A1
HAUSERMAN FOLDING CENTER DIVIDERS
GLASS WALL (HALF HIGH)
TV MONITOR & VIDEO TAPE STUDY ROOMS
GLASS PARTITION (HALF HIGH)
ROOM "F" 8' x 16'
ROOM "G" 4' x 16'
ROOM 'H" STUDY ROOM 15' x 24'
EXPANDED MARKS MEADOW LIBRARY

# APPENDIX C

## NONVERBAL CUES

## Nonverbal Cues

Probably when Eve was introduced to Adam, his first response was a gesture; one might imagine a smile, and an attempt to find the right thing to say. From that humble beginning humans have developed multimodal forms of communication, usually emphasizing words, but adding meaning and direction through the wide range of nonverbal elements.

To the teacher in the classroom, the world of words appears paramount. Students are expected to conceptualize words and word ideas, communicate orally using words in precise meaning. The beginning teacher faced with this expectation of performance, and anxiety on "how do I look" most times assumes a rigid, restricitve posture before the class; presents the materials in a monotone, and succeeds in communicating badly.

Studies indicate that each individual, culture and society have characteristic nonverbal postures, gestures, intonations, inflections, and movements. The use of movement seems to make a difference in the way words are perceived and understood. We react to the meaning of the phrase "Good Morning" more by the pitch of the voice, the facial expression, body posture and sweep of a hand than by the words alone. We are more acutely aware of miscommunication when the speaker of the words smiles, yet is hunched over, rigid, with fists locked tight. The message of something amiss strikes us immediately. When asked to explain the missmessage the usual response is that the words do not appear to be sincere or friendly.

Sensitizing to the nonverbal domain begins with the first lesson and the realization that the basic inner tension state is visible to students through actions. The effort to relax the face and body, physically move about, approach students, point,gesture and give meaning to the enthusiasm a teacher possesses, at first seems overwhelming. By systematically looking at nonverbal behaviors and practicing in a microteaching setting teachers can improve their range of nonverbal cues.

Of the many facets of nonverbal behavior we will examine seven general categories that the beginning teacher could develop increased awareness: a) eye contact, b) facial motion c) head motion d) body posture e) body motion f) arm hand finger motion g) directed arm hand finger motion.

Eye contact asks the question, where does the teacher focus his gaze. Teachers are encouraged to look at students one at a time, the class as a group, at an object or prop they are using. Insecure individuals tend to avoid looking at the class usually focusing at their hands or feet.

Facial motion asks the question, does the teachers facial expressions add enthusiasm to what is being said. Such motion as raising of the yebrows, smiling, laughing, frowning all add meaning to what is being said.

Head motion asks the question does the teacher add to the communication without the use of words. By the simple act of nodding either yes or no students can be encouraged or discouraged. By tilting the head the teacher can assume a pose which indicates thinking- students respond with clarification of what they are saying. By turning the head and focusing on a particular student that student can be drawn into a discussion. In this case a group could be directed without the teacher really saying a word.

Body posture asks the question, does the teacher stand or sit immobile before the class or does the teacher show enthusiasm and animation. By sitting, standing, leaning, folding and unfolding arms, hands clasped or unclasped, hands on hips, hands at sides, the class gains meaning of the inner tension state of the teacher.

Body motion asks the question, is the teacher fluid in motion and relaxed with and among the students. The manner in which the teacher shifts weight, shrugs the shoulders, bends from the waist or turns from the waist, walks towards a student or the group, or the board, whether the teacher circulates among the class or paces indicates the degree of self-confidence in the class situation.

Arm hand finger motion asks the question to what degree does the teacher use the arms, hands, and fingers to facilitate the flow of communication. Such actions as moving the hands across the body, up or down, using loops, sweeps, open or closed fists add to the image being projected by the teacher.

Directed arm hand finger motion asks the question does the teacher have enough confidence in himself to engage the students by pointing to students, or himself, writing on the board, or manipulating objects skillfully.

While not all nonverbal strategies are appropriate simultaneously, the smooth use of nonverbal cues has definite effects on the conduct of the class.

# APPENDIX D

# USING QUESTIONS IN TEACHING

## Using Questions In Teaching

Questioning as an instructional technique has been recommended to teachers since Socrates first used it to draw out ideas from students. A steady stream of books and monographs on the "art of questioning" have appeared over the years. These attest to the belief that appropiate questioning behavior is an important teacher characteristic. A common theme throughout the literature is that questioning is a means by which a teacher stimulates thinking -- the means with which she elicits higher order mental processes such as critical judgment. It was John Dewey who pointed out that thinking itself is questioning. It would seem that the critical requirement for a "good" classroom question is that the question prompt the student to use ideas rather than just remember them. The generally accepted premise is that the form of the question serves as the stimulus for eliciting certain kinds of cognitive activities which may range from simple recall to highly complex inferences from data.

Thus one of the first things a potential questioner must learn to recognize is the fact that questions have different characteristics. Among the many types of questions we may distinguish two, those which are factual or lower order and those which are more complex or higher order questions. Some people break down the lower order category into two sub-categories such as interpretation, analysis,synthesis, evaluation, etc. The reason for attempting to identify different kinds of questions is quite simple, it is believed that different types of questions produce different kinds of cognitive responses on the part of the students.

Not all the responses of students are cognitive. Some responses can be seen through simple observation of class-rooms. For example, when a teacher asks a simple memory question like, "who was the sixteenth president?" you often notice students wildly raising their hand, and/or you can hear such sounds as "ooh-ooh" and others which in general try to attract the teacher's attention, in order to be called upon. The students are <u>sure</u> they know the answer. They are sure they can deliver a response for which the teacher will respond positively to them. On the other hand, when a question is highly complex, students will often ask for clarification of the question of show signs of puzzlement or tentativeness in the hand-raising that occurs. These are observable behavioral indicators of the simplicity or complexity of the various questions that are being asked. Thus even through simple observation, and without any access to the cognitive structure of students, we can often see the effects of questions.

Questions can also be asked in certain kinds of sequences. For example, a number of factual questions in a row can be used to establish a certain data base. This can be followed by a higher-order question which incorporates material from the established factual data base. Other strategies might call for simple alternation of lower-order and higher-order questions. The "correctness" or "incorrectness" of using the various strategies is unknown. What is desirable is that the teacher recognize that such strategies do exist.

Adapted from "Instructors Manual: Protocol Materials on Questioning
D. Berliner 1971

# APPENDIX E

## THE NATURE AND PROCEDURES OF THE SET INDUCTION PROCESS

### The Definition of Set Induction:

Inducing a learning set is an initiating act on the part of the teacher for the purpose of establishing a frame of reference deliberately designed to facilitate the creation of a communicative link between the experimental field of the pupils and the desired behavioral goals of the learning experience.

### Purposes of the Set Induction Procedure

1. The induced set is the initial instructional move of the teacher; its purpose is to focus pupil attention on some commonly known experimental referent (i.e., a person, an object, an event or a condition).

2. The induced set functions as a point of reference around which the pupils and the teachers establish a communicative system. A stated frame of reference becomes the vehicle which the teacher uses to make a transition from the known to new or difficult material ( a concept, generalization or principle ).

3. The induced set lends meaning to the new concept or principle to be taught through deliberate use of analogy, rather than through simple association between familiar and unfamiliar material.

4. The induced set is an intentional procedure to encourage pupil interest and involvement in the main body of the lesson that will follow as well as facilitating maximum teacher-pupil communication.

### Operational Rules for the Set Induction Process

1. The set induction process is deliberately employed by a teacher whenever a new unit or difficult information necessitates a new or modified frame of reference.

2. The induction of set usually occurs at the beginning of a class period but it may be employed within a class period whenever the activity, the goal or the content changed, thereby necessitating a new or modified frame of reference.

3. Set induction is used in building continuity

from lesson to lesson and from unit to unit. Thus, a new set may be linked to a previously induced set or series of sets.

4. Set induction is used to generate positive pupil-teacher interaction toward the immediate lesson at hand, and to encourage pupil interest and involvement in learning.

Example of Inducing a Set in Teaching

In a biology class on an introductory unit on "The Process of Photosynthesis," the teacher might induce a set in the first lesson in the following manner:

1. Orientation: The teacher begins the lesson by exhibiting a bottle of milk for the purpose of generating a discussion of the process of milk production by cows.

2. Transition: The teacher uses the cow as analogous to a manufacturing plant in which it consumes raw material ( hay and water ), adds its own enzymes and energy to produce a product and a by-product ( milk and manure ). This process may be simply illustrated on the blackboard in the following way: Raw material ( hay and water ) to cow ( enzymes and energy ) to product and by-product ( milk and manure ).

3. Operation: The teacher introduces the process of photosynthesis by relating it to the above analogue in the following manner: Raw material ( water and carbon dioxide ) to process ( sunlight and chlorophyll ) to product and by-product ( sugar and oxygen ). This could be illustrated with overlays on an overhead projector.

4. Evaluation: The teacher then seeks pupil comprehension through asking general questions about the process of photosynthesis. When the teacher believes that the pupils have grasped the concept, he would then proceed into the main body of the lesson with more difficult material and eventually to the Krebs cycle.

Aubertine ( 1964:9-13 )

# APPENDIX F

# INSTRUMENT FOR THE SYSTEMATIC OBSERVATION OF NONVERBAL BEHAVIORS

Instrument for Systematic Observation
of Nonverbal Behavior

| Eye Contact | Facial Motion | Head Motion | Body Posture | BODY MOTION | ARM HAND FINGER MOTION | DIRECTED ARM HAND FINGER MOTION | T |
|---|---|---|---|---|---|---|---|
| 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | |
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| 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | |
| 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | |
| 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | |
| 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | |

Tape_____ Observation_____ No._____

Date_____

# APPENDIX G

## CATEGORIES FOR OBSERVING STUDENT TEACHER'S NONVERBAL BEHAVIOR

G1- Categories of Nonverbal Behavior

G2- Qualities of Nonverbal Behavior

G-1

Categories for Observing Student

Teacher's Nonverbal Behavior

A) EYE CONTACT

Student
Group
Class
Board/Object
Avoiding-Away
Downcast

B) FACIAL MOTION

Raised Eyebrow/s
Grin
Slight Smile
Full Smile
Laugh
Frown
Grimace/Pursed Lips

C) HEAD MOTION

Nod/s
Inclined
Turns Head to R or L
Turns "No"

D) BODY POSTURE

Stands
Sits
Leans
Slouches
Arm/s Folded
Hands Clasped
Hand/s on Hip/s

E) BODY MOTION

Shifts Weight
Shrugs Shoulders
Bends from Waist
Turns from Waist
Walks to Student
Circulates
Paces

F) ARM-HAND-FINGER MOTION

One Arm-Hand
Both Arms Hands
At Side of Body
In Front of Body
Across Body
Away from Body
Toward Body
R-L or L-R
Up and Down
Loop/s
Sweep/s
Palm/s Out from Body
Palm/s In to Body
Palm/s Down
Palm/s Up
Palm/s Vertical
Partial Fist
Closed Fist
All Fingers Extended
Index Finger Extended
Other Finger Position

G) DIRECTED ARM-HAND-FINGER MOTION

One Arm-Hand
Both Arms-Hands
Pointing to Self
Pointing to Student
Pointing to Group/Class
Pointing to Board/Object
Touching Self
Touching Board/Object
Grasping/Holding Object
Manipulating Object
Writing/Drawing on Board

G-2

Qualities for Observing Student

Teacher's Nonverbal Behavior

Enthusiastic

Nonverbal behaviors that evoke qualities of unusual enthusiasm, warmth, encouragement, or emotional support for students or topic.

Receptive-Helpful

Nonverbal behaviors that evoke qualities of attentiveness, patience, willingness to listen, acceptance or approval; a responsiveness to students or situations implying receptiveness of expressed feelings, needs or problems.

Clarifying-Directive

Nonverbal behaviors that evoke qualities of clarification, elaboration, direction or guidance.

Neutral

Nonverbal behaviors that evoke qualities of little or no supportive or unsupportive significance within contextual situations; routine acts.

Avoidance-Insecurity

Nonverbal behaviors that evoke qualities of avoidance, insecurity, insensitivity, impatience, ignorance, or disruption to students, topic or situations.

Inattentive

Nonverbal behaviors that evoke qualities of inattentiveness, pre-occupation, apparent disinterest; an unwillingness or inability to engage students, topic or situations.

Disapproval

Nonverbal behaviors that evoke qualities of disapproval, dissatisfaction, disparagement or negative overtones to students, topic or situations.

## APPENDIX H

## GUIDELINES TO JUDGES

1. Eye Contact: Judge all eye positions that can be seen. Category is primarily one of focus. Use zero only when head is in a position where eye poisition, motion or focus cannot be discerned.

2. Facial Motion: Category includes position as well as motion. Includes all feature motions such as smiles, frowns, raised eyebrows, etc., as well as composite facial position or expression such as "passive", "perplexed", "sarcastic", "enthusiastic", etc.

3. Head Motion: All head position as well as motions are judged.

4. Body Posture: Primarily a positional category and not a motion category.

5. Body Motion: Primarily a motion category. When no evidence of motion is discernable score zero.

6. Arm-Hand-Finger Motion: Category is one of position and motion.

7. Directed Arm-Hand-Finger Motion: Category is one of position and motion, characterized by touching, pointing, and manipulating behaviors.

8. Arm-Hand-Finger Motion and Directed Arm-Hand-Finger Motion are two distinct categories. When no evidence of the behaviors contained in either category are discernible, whether it be one or both arms-hands, score zero.

9. In juding qualities of nonverbal behavior in each category, remember that only an intuitive judgment is to be made, i.e., no analysis.

10. Do not give the student teacher "benefit of the doubt", judge on the first intuitive perception only.

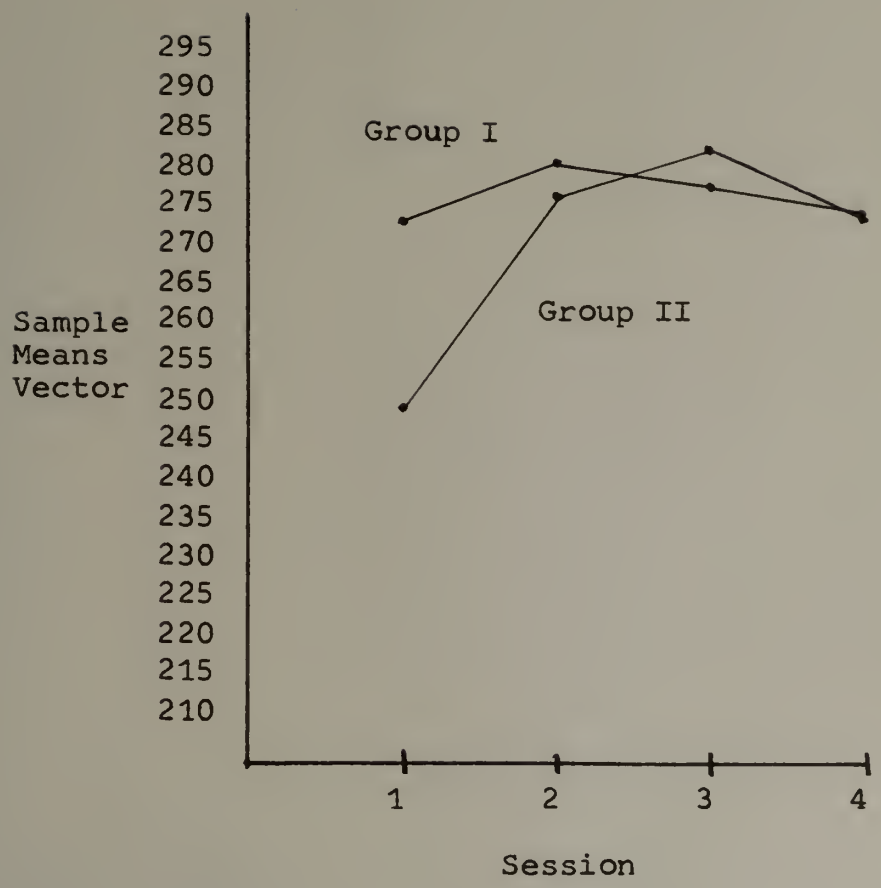
# APPENDIX I

# PROFILE ANALYSIS

# STUDENT DATA

Profile Analysis

Eye Contact

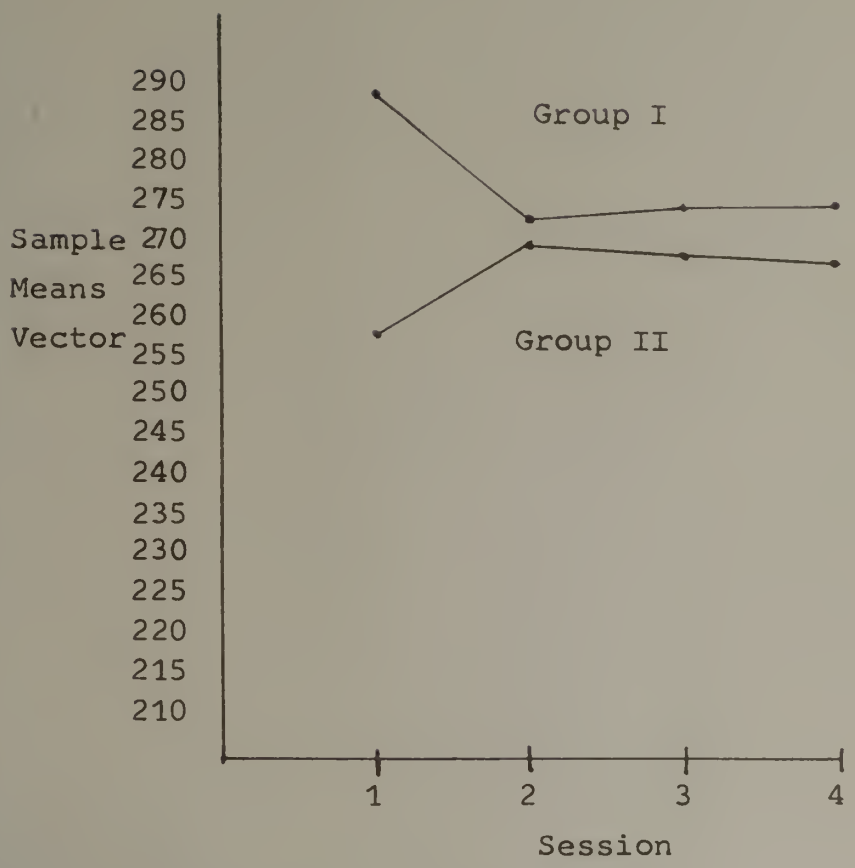



(a) Similarity of Mean Profiles (Parallel Profiles)
F= 2.5098 with 3 and 36 degrees of freedom

(b) Assuming A is true, same level of mean profiles
t= 0.0135 with 38 degrees of freedom

(c) Assuming A is true are the Mean Vectors Different
F= 5.0394 with 3 and 36 degrees of freedom

Profile Analysis
Facial Motion

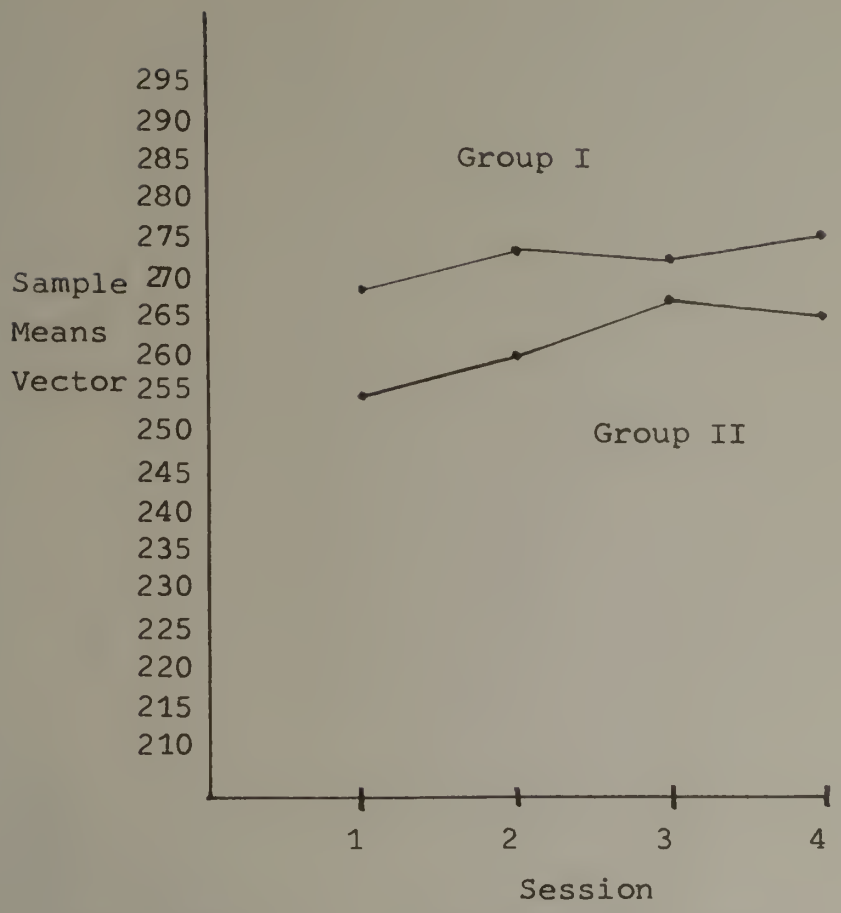



(A) Similarity of Mean Profiles ( Parallel Profiles)
F= 0.9265 with 3 and 36 degrees of freedom

(B) Assuming A is true, same level of mean profiles
t= 0.0320 with 38 degrees of freedom

(C) Assuming A is true are the Mean Vectors
Different
F= 0.0267 with 3 and 36 degrees of freedom

Profile Analysis
Head Motion

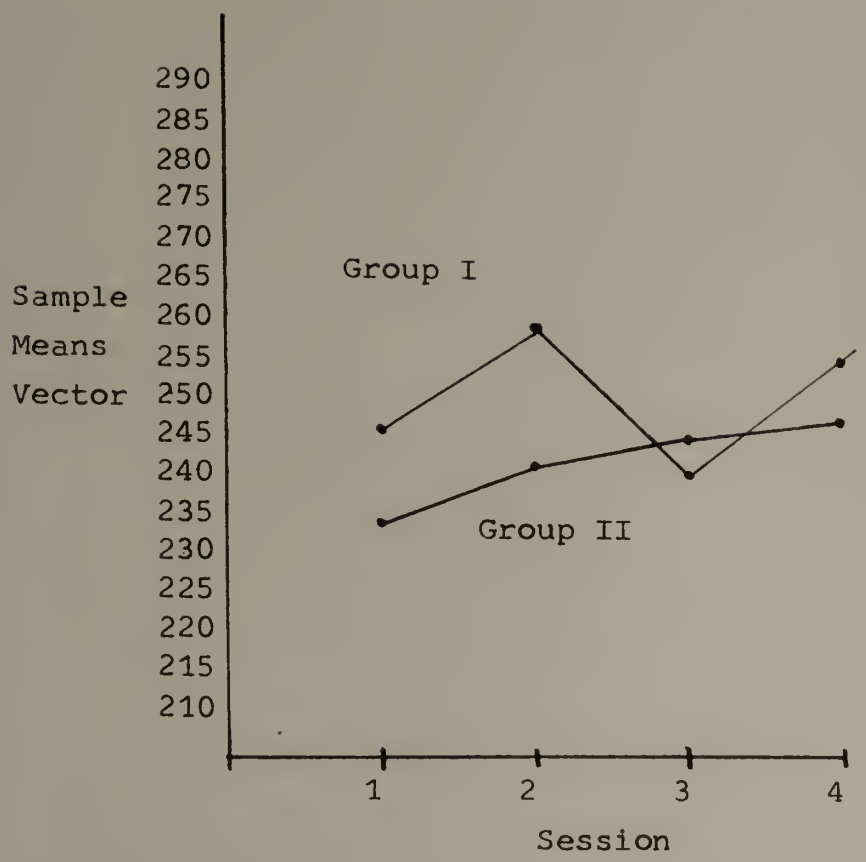



(A) Similarity of Mean Profiles (Parallel Profiles)
F= 0.8362 with 3 and 36 degrees of freedom

(B) Assuming A is true, same level of mean profiles
t= 0.0379 with 38 degrees of freedom

(C) Assuming A is true are the Mean Vectors Different
F= 3.7847 with 3 and 36 degrees of freedom

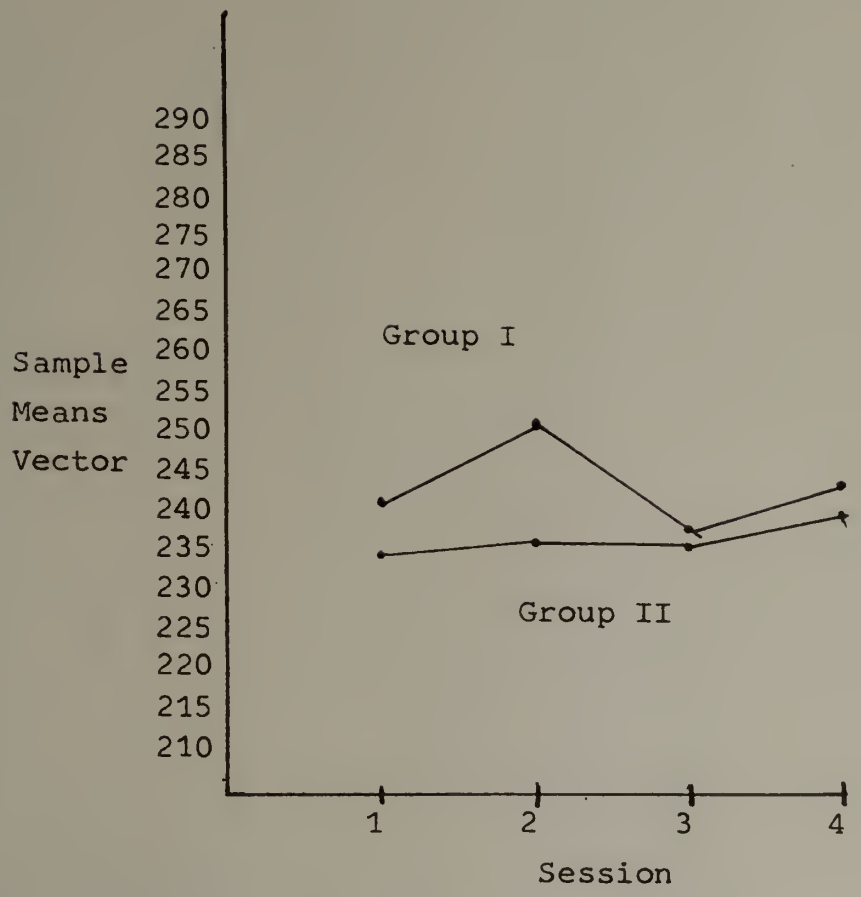
Profile Analysis
Body Posture




(A) Similarity of Mean Profiles ( Parallel Profiles )
F= 3.0212 with 3 and 36 degrees of freedom*

* significant at the .05 level

Profile Analysis
Body Motion

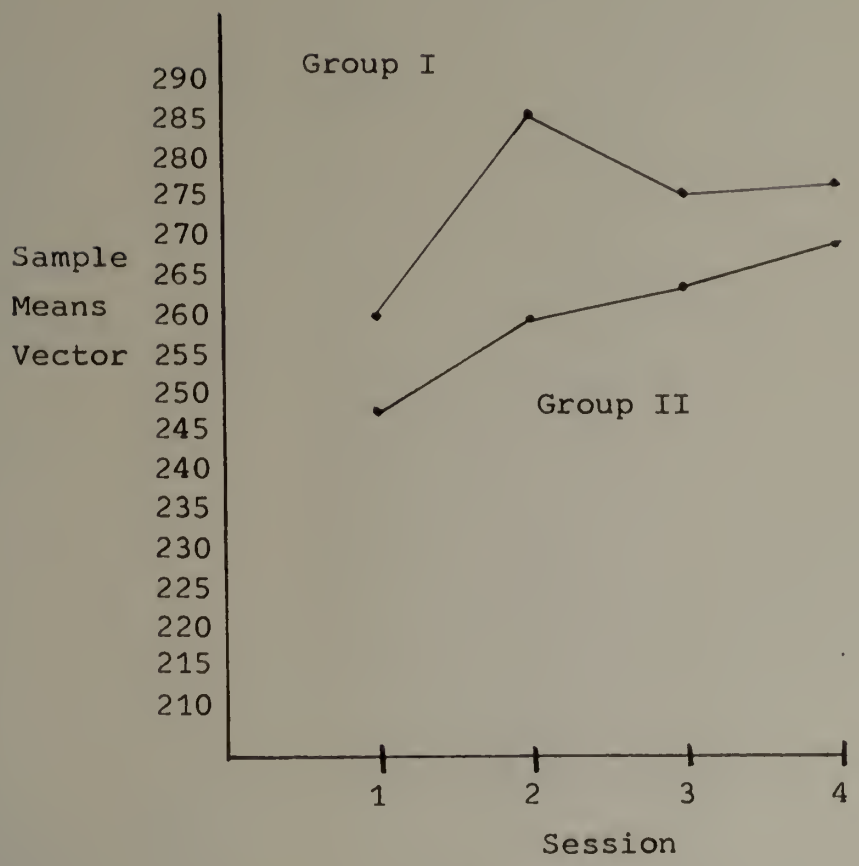



(A) Similarity of Mean Profiles (Parallel Profiles)
F= 1.3851 with 3 and 36 degrees of freedom

(B) Assuming A is true, same level of mean profiles
t= 0.0481 with 38 degrees of freedom

(C) Assuming A is true are the Mean Vectors Different
F= 2.0910 with 3 and 36 degree of freedom

Profile Analysis
Arm Hand Finger Motion

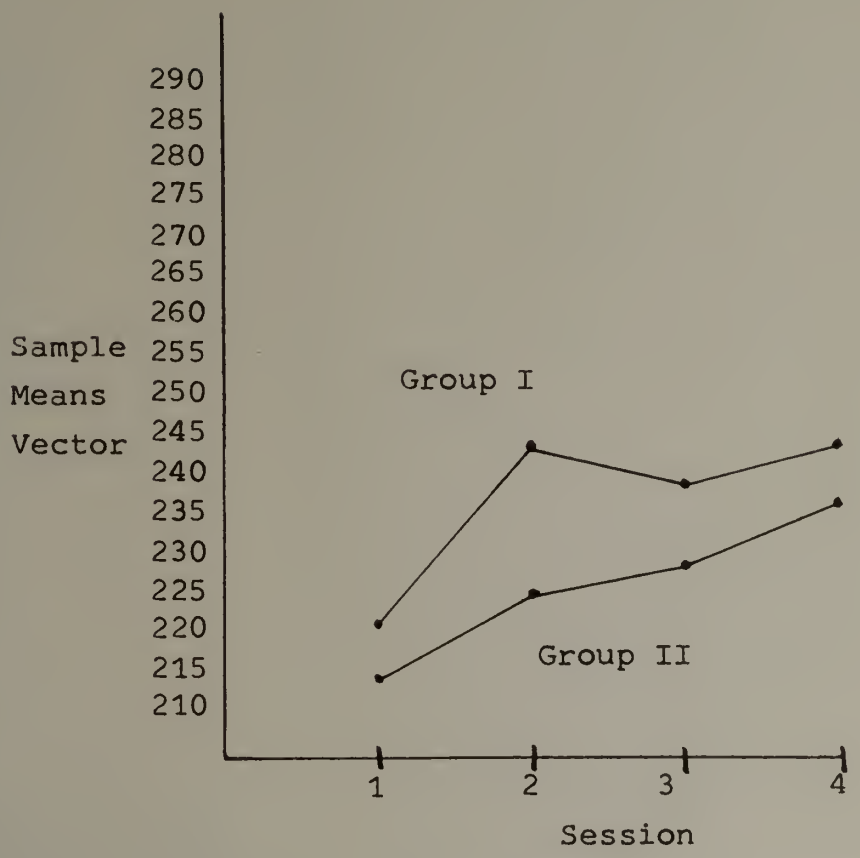



(A) Similarity of Mean Profiles (Parallel Profiles)
F= 0.9883 with 3 and 36 degrees of freedom

(B) Assuming A is true, same level of mean ppofiles
t= 0.0458 with 38 degrees of freedom

(C) Assuming A is true are the Mean Vectors
Different
F= 2.1254 with 3 and 36 degrees of freedom

Profile Analysis
Directed Arm Hand Finger Motion

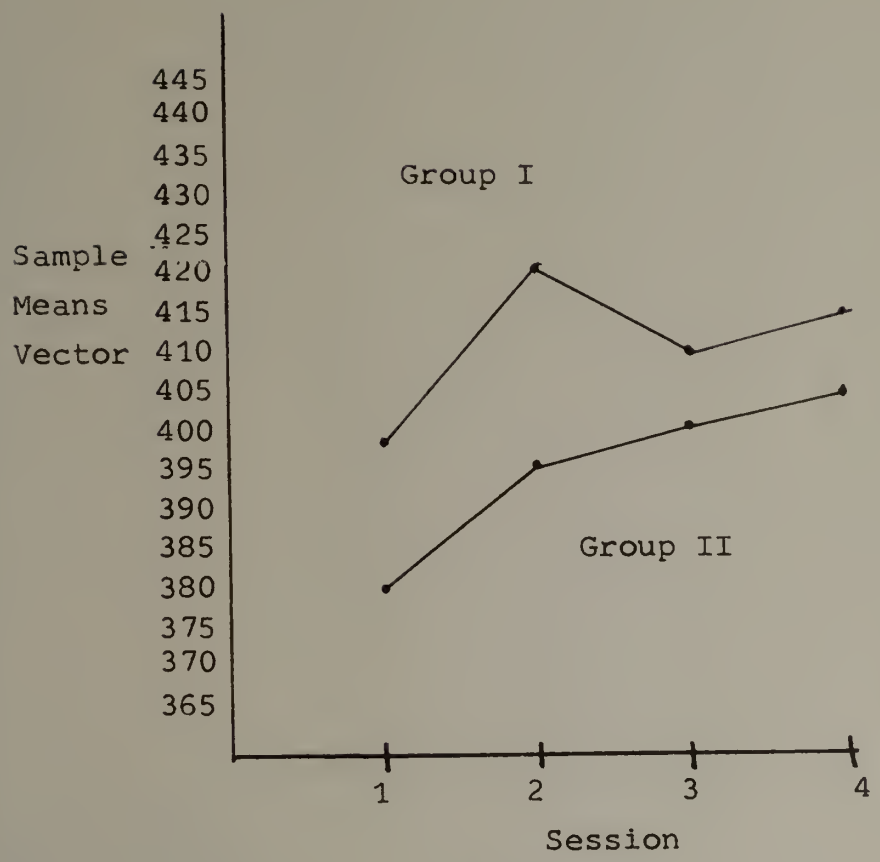



(A) Similarity of Mean Profiles (Parallel Profiles)
F= 0.4556 with 3 and 36 degrees of freedom

(B) Assuming A is true, same level of mean profiles
t= 0.0197 with 38 degrees of freedom

(C) Assuming A is true are the Mean Vectors Different
F= 2.4860 with 3 and 36 degrees of freedom

Profile Analysis
Total Mean Score



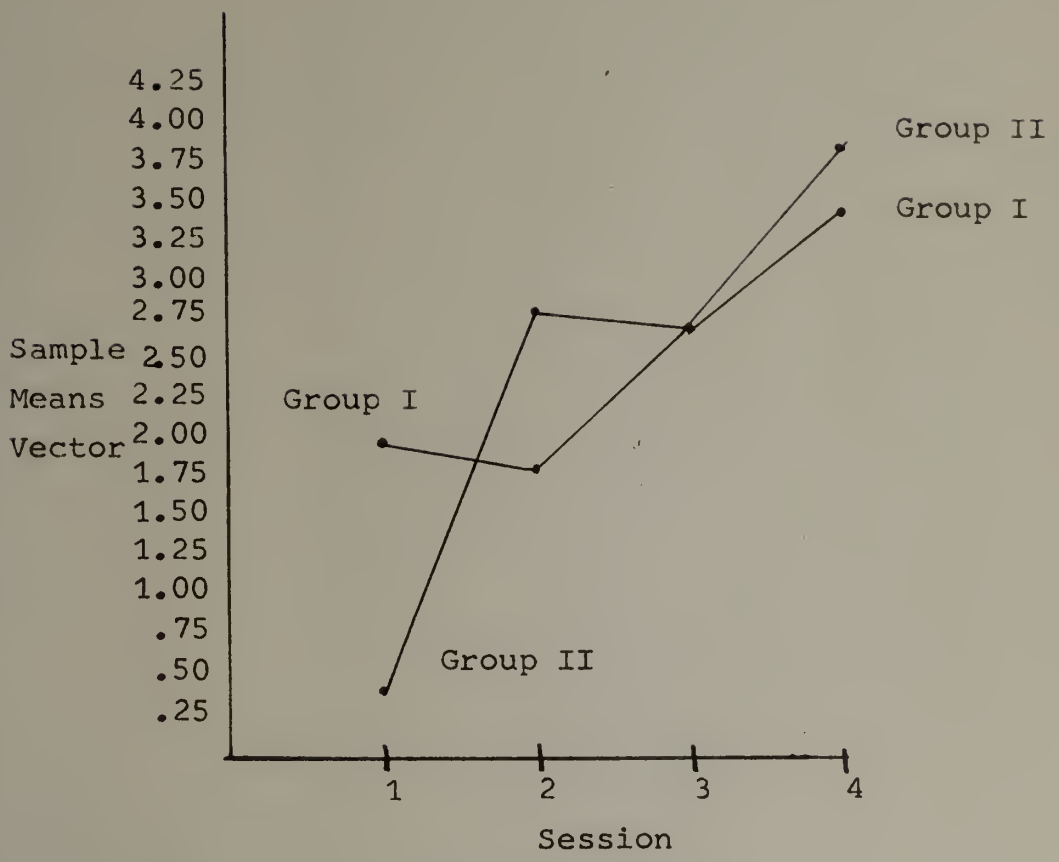

(A) Similarity of Mean Profiles (Parallel Profiles)
F= 0.6318 with 3 and 36 degrees of freedom

(B) Assuming A is true, same level of mean profiles
t= 0.0298 with 38 degrees of freedom

(C) Assuming A is true are the Mean Vectors Different
F= 2.7925 with 3 and 36 degrees of freedom

Profile Analysis

Questions Asked




(A) Similarity of Mean Profiles (Parallel Profiles)

F= 1.9105 with 3 and 36 degrees of freedom

(B) Assuming A is true, same level of mean profiles'

t= 0.0131 with 38 degrees of freedom

(C) Assuming A is true are the Mean Vectors Different

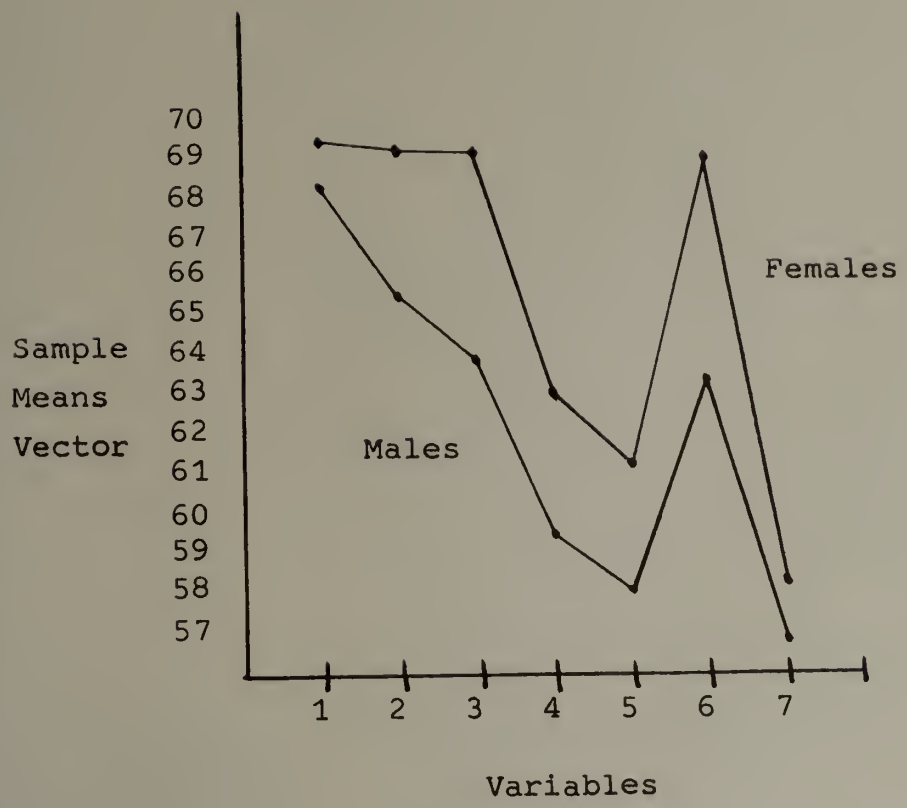
F= 7.2984 with 3 and 36 degrees of freedom

# APPENDIX J

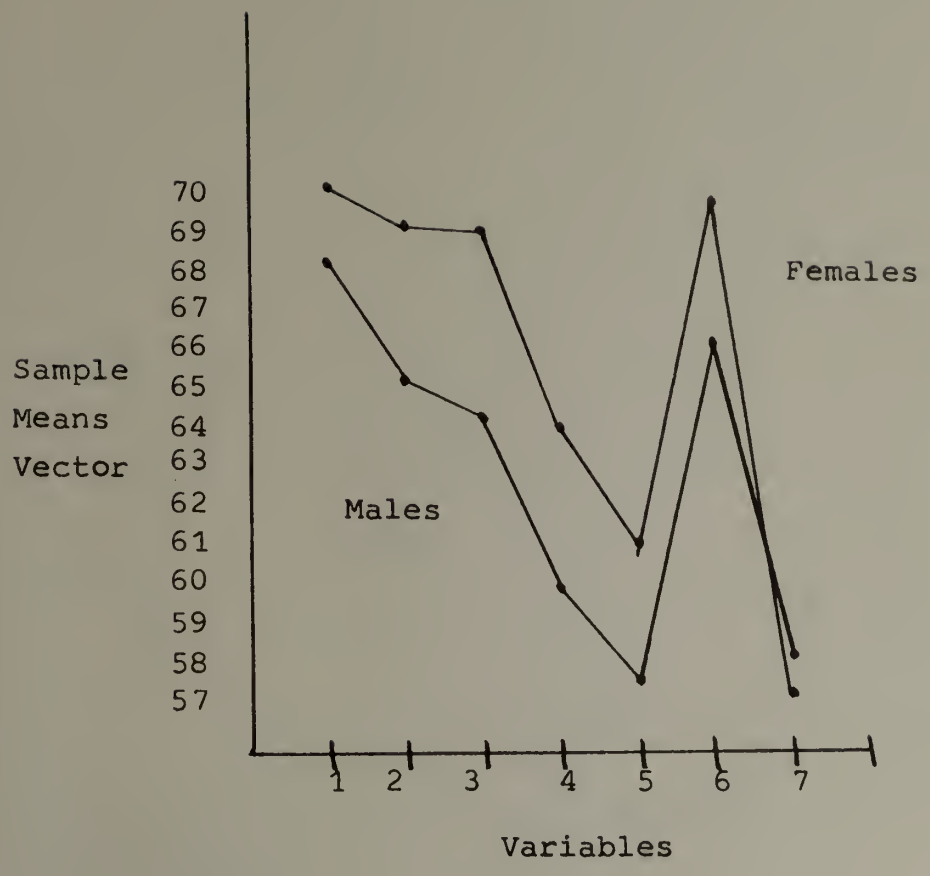
# PROFILE ANALYSIS

# RATER DATA

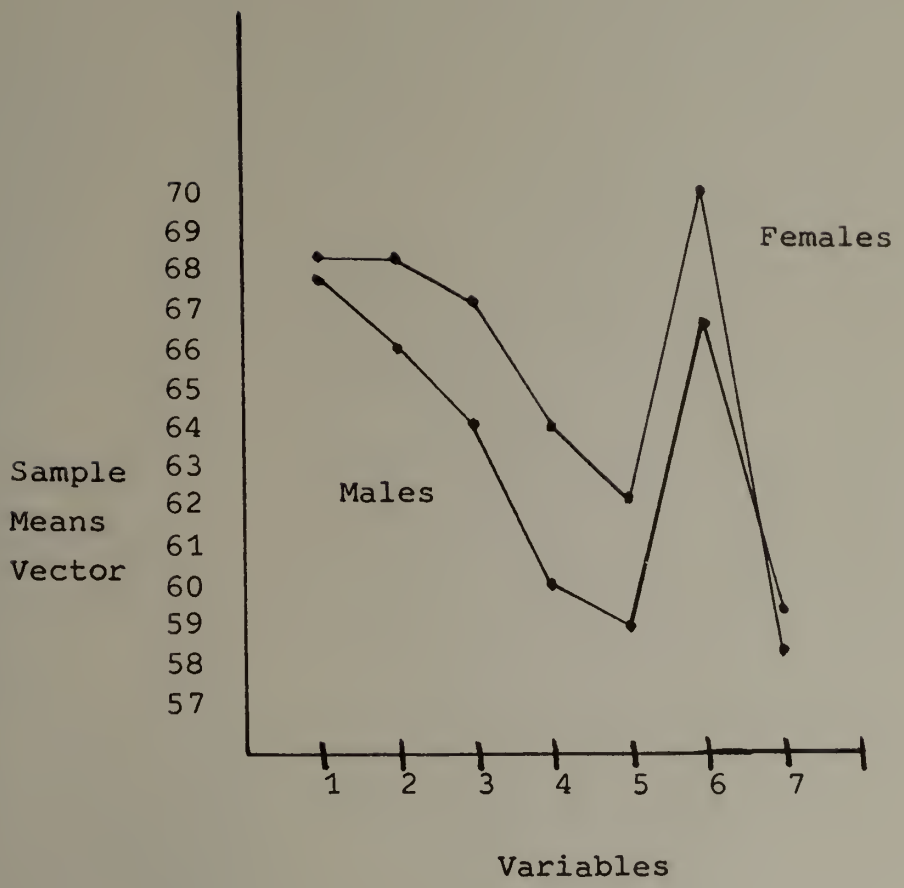
Profile Analysis
Rater Scores
Session 1



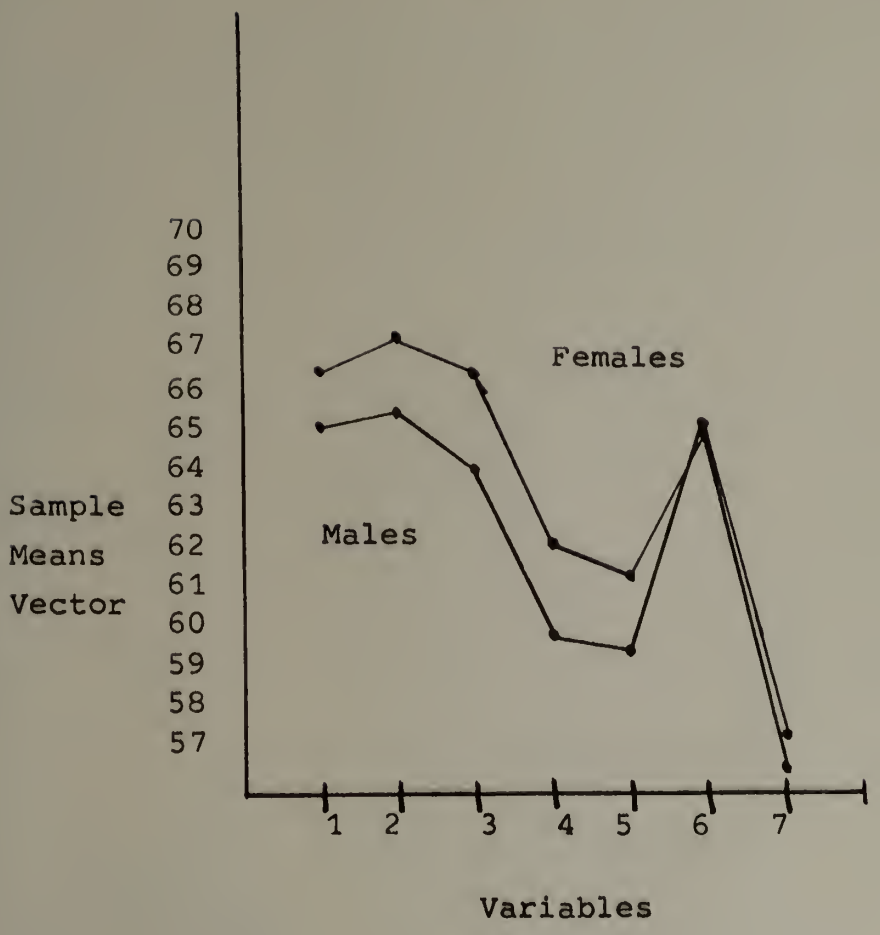
Profile Analysis
Rater Scores
Session 2



Profile Analysis
Rater Scores
Session 3



Profile Analysis
Rater Scores
Session 4



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